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JANUARY 30, 1959

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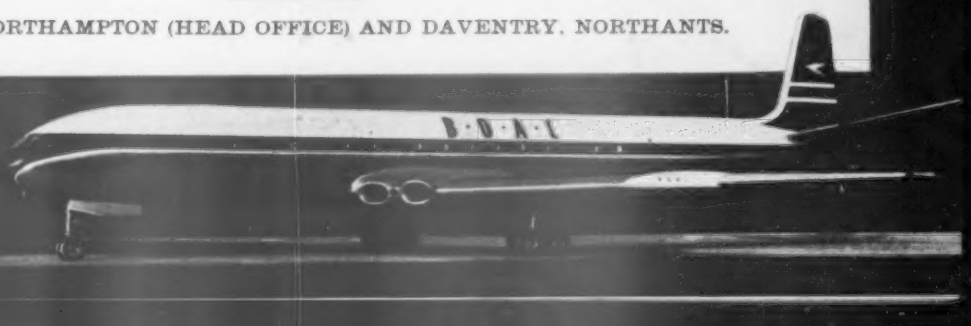

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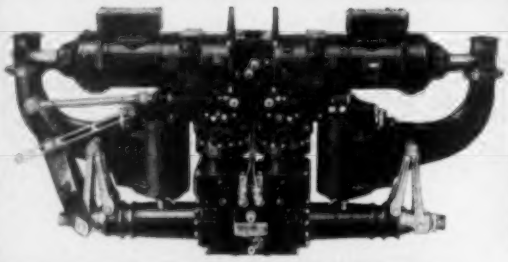

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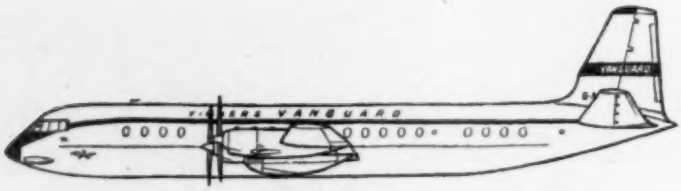

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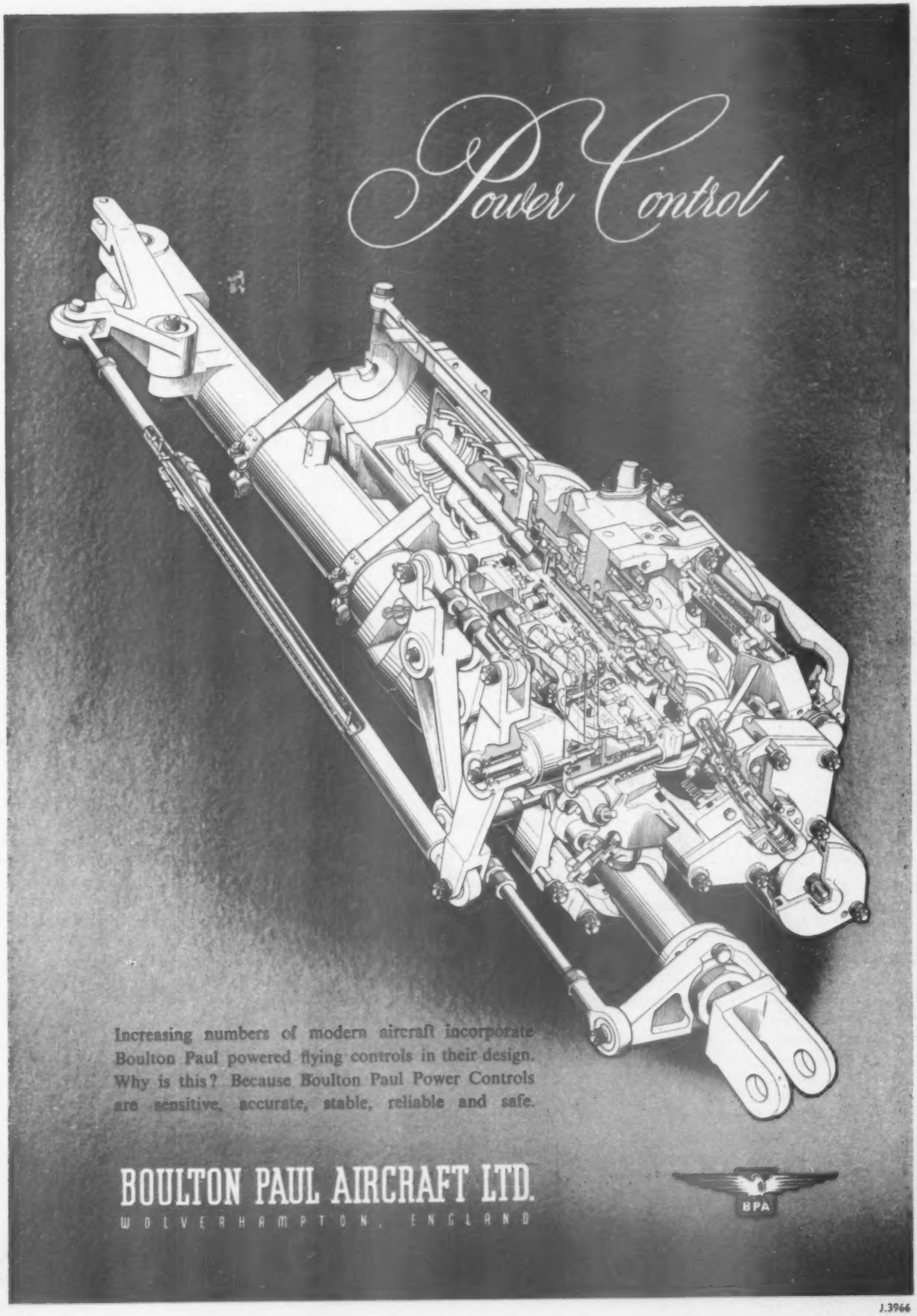
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Founder and First Editor
(1911-1939), C. G. GREY

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RESPITE FOR THE MALCOLM CLUBS

THERE will be widespread relief at the outcome of the debate in the Lords on January 22 when the proposed closure of the Malcolm Clubs was discussed for over three hours. Even if the gift horse has, as Lord Tedder neatly put it, a kick in the tail, the Government has undertaken to take no steps towards the closing down of any Malcolm Club during the next 12 months, that is until the end of 1959. During that time it is hoped that the Malcolm Clubs will be able materially to improve their position. During that period the subsidy, whatever it may be, £30,000 or any other sum necessary to make up the cash loss for the year, will be paid.

It is now getting on for 16 years since the Malcolm Clubs came into being. At the opening of the debate Lord Tedder told how it all began in Algiers in May, 1943. At that time the numbers of British and U.S. servicemen had become too large for the first-class welfare centre run by the U.S. Red Cross and it had to be restricted to American personnel only. Unsuccessful attempts were then made to get N.A.A.F.I. to open a club in the town.

Lord Tedder went on to say, "General Eisenhower was also worried about this problem, and got into touch with the lady who is now my wife, who was working at the time for the Americans, and asked her whether she could not do something about it. That something proved to be the opening of the first Malcolm Club. It comprised only one room, which had been a café, and two basement rooms. Being so small, of course, we could open it only to the Royal Air Force. The name, that of a gallant young Wing Commander who had been awarded a posthumous V.C. for operations over Tunis, was suggested by the then Secretary of State, Sir Archibald Sinclair (as he then was), during a visit to Algiers. When I opened it I said to the troops, 'This is your club: keep it going.' That chance phrase set the pattern for the future. When we got to Tunis the airmen came along and said, 'Hey, where is our club?', and so the second club was born and so on. That is how it happened."

Later in the debate it was disclosed that the start in Algeria was made by virtue of a loan, equivalent to around £250, from a Frenchman as token of his gratitude for the Battle of Britain.

From that beginning the Clubs spread to over one hundred places in different parts of the World. They form a non-profit-making organization which has always shown itself to be very conscious of the fact that the money the Clubs handle is the airmen's money. Where there have been profits they have been ploughed back to provide better service for the men.

Such an organization, it can be readily seen, has flexibility or, if you prefer it, an ability to step in, meet emergencies and improvise rapidly. This was shown at the time of the Berlin air lift. Another example occurred when a crisis broke out in the Middle East in 1952. At that time the Malcolm Clubs in the Canal Zone were packing up, to coincide with the departure of the troops from the Canal Zone. Then a boycott broke out, and there was all sorts of unpleasantness. Except for the N.A.A.F.I. supply depot in Ismailia, all the N.A.A.F.I. activities stopped. They could not help it, because the N.A.A.F.I. labour by which they were manned deserted en masse. Lord Tedder had a personal appeal by cable from the A.O.C.-in-C., and, as a result, a team of Malcolm Club ladies were collected, most of them from Germany, and flown out, not only at short notice but also at heavy expense because they had to pay full civil fares.

However, to leave the field free for the N.A.A.F.I. in the United Kingdom, the Air Council has given permission for only one Malcolm Club to be put up at a R.A.F. station, and that is at Wittering. Reading between the lines its genesis must have been amusing.

Today there are 14 Malcolm Clubs. There is one at every R.A.F. station in Germany, except at Sylt, which was closed down by Air Ministry pressure some three months ago. Two of the three R.A.F. stations in Singapore have Malcolm Clubs. The Air Ministry has refused permission for Clubs in Aden and Cyprus.

However, it was made clear by Noble Lords in the course of the debate how widespread is the desire that the notable work being done by the Malcolm Clubs organization should not be brought to an end. Obviously it is not possible here to recapitulate the course of the debate in detail. Much of it was taken up with efforts to establish the exact degree in the difference of treatment extended to the Malcolm Clubs and other charitable organizations. Bearing in mind that part of the official financial support was by way of a deal in Deutschmarks it will be realized that the explanations were sometimes hard to follow.

It is to be hoped that during the twelve months' respite means will be found to provide the Malcolm Clubs with working capital. This should then ensure that the work and help, socially and of every kind, which they have been able to give to so many airmen will still go on.

C

Matters of Moment

Last Year's Record Exports

FIGURES just issued by the Society of British Aircraft Constructors show that during 1958 the value of the aircraft industry's exports totalled £154,100,962, a figure which accounted for some 11% of the United Kingdom's total engineering exports; exceeded the previous year's record of £116,471,110 by 33%; brought the value of total aviation exports since the War to £787,019,166; and represented a monthly average of £13 million.

Since 1955, when a record annual total of £66,207,022 was achieved, the industry has increased its value of overseas sales by some 133%.

Both the aircraft and parts and the aero-engine totals showed big gains over previous record totals. The former, at £98,539,800, increased by 37% compared with the 1956 record of £71,769,410; the latter, at £49,557,723, showed a gain of 22% over the previous best in 1957 of £40,642,162.

The quarterly figures for total exports were:—

January-March, £36,328,552; April-June, £40,803,529; July-September, £39,037,055, and October-December, £38,098,051. The total for the second period was the largest ever achieved by the aircraft industry. Aircraft and parts quarterly totals were £23,206,040, £27,034,847, £25,162,431 and £23,159,200, while equivalent totals for aero-engines were £11,742,219, £12,380,001, £12,343,905 and £13,249,184.

Examination of the list of leading overseas buyers shows a marked increase in dollar sales to Canada and the United States, which amounted to £27 million worth, compared with £9 million worth in 1957 and £19 million worth in 1956.

The December, 1958, total of £12,175,408 owed much to sales of aero-engines. Aircraft and parts amounted to £7,558,396; aero-engines, £4,119,844; electrical parts and appliances, £211,078; tyres, £66,522, and aeronautical instruments, £219,568. India was the best customer (£1,624,871), followed by South Africa (£824,444), West Germany (£780,954), the U.S. (£652,266), Brazil (£552,725) and Turkey (£365,784).

The record annual total was made up of:—

Aircraft and parts, £98,539,800 (compared with £69,767,417 in 1957); aero-engines, £49,557,723 (£40,642,162); electrical appliances, £3,296,857 (£3,267,975); tyres, £624,657 (£814,340); and aeronautical instruments, £2,081,925 (£1,979,216).

Leading buyers of aircraft and parts during the year were:—

India (£18,403,670); Canada (£14,120,206); the U.S. (£12,866,611); West Germany (£10,162,785); South Africa (£3,173,242); Australia (£3,068,350); the Netherlands (£2,722,742); Brazil (£2,329,798) and Switzerland (£2,005,704). Six other countries bought £1 million worth or more.

Guiding the Air League

HIS GRACE THE DUKE OF HAMILTON AND BRANDON, K.T., G.C.V.O., A.F.C., who, as we briefly announced last week, has accepted an invitation to become president of the Air League of the British Empire, has for many years been active in the aviation world. As the Marquess of Clydesdale he was chief pilot of the Mount Everest expedition of 1933, sponsored by Lady Houston, when for the first time aircraft—two Westland biplanes—flew over the peak.

The Duke of Hamilton and Brandon (left), and Air Chief Marshal Sir Francis Fogarty, whose new appointments as president and chairman, respectively, of the Air League of the British Empire are recorded on this page.

DIRECTORS OF H.S. AVIATION.—Sir Roy Dobson, chairman of the newly formed Hawker Siddeley Aviation, Ltd., with the company's joint managing directors, Mr. J. A. R. Kay (left) and Mr. J. T. Lidbury (right).

He joined No. 602 (City of Glasgow) Squadron, Auxiliary Air Force, in 1927 and commanded it from 1931 to 1936, after which he was posted to the general list of the A.A.F. For the duration of the Second World War he served in the R.A.F., and is now an Hon. Air Commodore R.Aux.A.F.

Besides this new appointment His Grace is president of BALPA, chairman of Scottish Aviation, Ltd., and chairman of the Scottish Welfare Council of the A.T.C.

The retiring president of the Air League, the Rt. Hon. the Viscount Thurso of Ulster, K.T., P.C., C.M.G., LL.D., has held office for two years, but has to withdraw for health reasons.

The new chairman of the Air League is, as we said last week, Air Chief Marshal Sir Francis Fogarty, G.B.E., K.C.B., D.F.C., A.F.C., who succeeds Air Chief Marshal Sir George Pirie, K.C.B., K.B.E., M.C., D.F.C., LL.D., chairman since 1952.

Sir Francis retired from the R.A.F. in 1957, when he was Air Member for Personnel. He had been in the Service since 1918, serving with No. 98 Squadron. He later commanded No. 84 Squadron, and holds the R.A.F.'s A.1 flying-instructor certificate.

At the beginning of the Second World War he was commanding No. 37 Squadron; in 1943 he went to Ottawa with the R.A.F. Mission and was closely concerned with the training of R.A.F. pilots in Canada. Later he was S.A.S.O., No. 4 Group, Bomber Command, and was commanding the R.A.F. in Italy at the end of the War.

From 1949 to 1952 Sir Francis was Commander-in-Chief, F.E.A.F.; at present he is director-general of the E.S.U.

Hawker Siddeley Integration

LAST OCTOBER, Sir Roy Dobson, managing director of the Hawker Siddeley Group, formally confirmed what had been an open secret for some time—that the Hawker Siddeley Group had decided to integrate its aeronautical interests into a single Aviation Division. At that time, however, nothing was said about the detail composition and internal organization of the new Division and many people felt that the announcement was by way of being a preliminary step towards further rationalization within the Group. A clue to the way in which this was to be done was given by Sir Thomas Sopwith at the annual general meeting on January 15 when he stated that each of the Group's two new Divisions, Aviation and Industrial, would be controlled by a holding company with its own board and bearing the responsibility for co-ordinating and directing the activities of the various companies in the Division concerned.

Sir Roy Dobson has now announced the formation of Hawker Siddeley Aviation, Ltd.—a new subsidiary company of the

Hawker Siddeley Group and controller of its Aviation Division. Sir Roy is to be chairman of this new company with Mr. Hugh Burroughes as deputy chairman. Mr. J. A. R. Kay and Mr. J. T. Lidbury have been appointed joint managing directors; and the remainder of the board will comprise Mr. J. F. Robertson, Sir William Farren, Sir Sydney Camm, Mr. H. M. Woodhams, Mr. S. D. Davies and Mr. D. E. Haynes (secretary). All the Group's aeronautical interests are thus represented on the controlling board.

Mr. J. A. R. Kay, F.R.Ae.S., was born in November, 1914, and educated at Cheltenham College. He was apprenticed to the Armstrong Whitworth and A. V. Roe companies and remained with the latter for some years until leaving to become managing director of Northern Aircraft and Engineering Production, Ltd. He returned to Avro, however, in 1941 as general superintendent responsible for co-ordinating the company's daughter firms and subcontractors associated with Lancaster production. In 1947 he was appointed executive assistant to Sir Roy Dobson and was made a director in 1950. Mr. Kay became general manager of A. V. Roe in 1955 and has since played a leading part in the development and production of the Vulcan and its stand-off bomb.

Mr. J. T. Lidbury's career started with 12 years' association with a prominent insurance group in London. He joined Hawker Aircraft in 1940 on the secretarial side and in the following year was appointed assistant secretary to the company. In 1948 Mr. Lidbury became secretary of Hawker Aircraft and its subsidiary Hawker Sanders, Ltd. He also became secretary of Hawker Aircraft (Blackpool), Ltd., when it was formed in 1951 and that year, too, he was elected to the Hawker board. In 1953 he was appointed general manager of Hawker Aircraft, Ltd., and three years later, general manager of Hawker Aircraft (Blackpool), Ltd.

Mr. Burroughes, the deputy chairman of Hawker Siddeley Aviation, Ltd., is deputy managing director of the Hawker Siddeley Group, Ltd., and is on the board of a number of companies including Gloster Aircraft, Armstrong Siddeley Motors, H. M. Hobson, and High Duty Alloys. Mr. J. F. Robertson, C.A., is a Group director and its treasurer; Sir William Farren is technical director of A. V. Roe; Sir Sydney Camm is director and chief designer of Hawker Aircraft; Mr. H. M. Woodhams is managing director of Armstrong Whitworth Aircraft; Mr. S. D. Davies, until recently managing director of Dowty Fuel Systems, Ltd., rejoined the Group last August in a special appointment; and Mr. D. E. Haynes has been a member of the Group's secretarial team.

The new organization will have plenty to concern itself with. In addition to the A.W. Argosy freighter which is on order for the R.A.F.'s Transport Command, there is the Avro 748 twin-turboprop airliner project, the Hawker VTOL fighter, the A.W. Seaslug surface-to-air guided-weapons system and the Avro stand-off bomb. And production of the Vulcan, Hunter, Javelin and Shackleton continues.

Help for Aerobatic Pilots

THAT well-known private flying enthusiast, Mr. Norman Jones, writes:—

The Lockheed Aerobatic Trophy, competed for annually at Coventry, thanks to the generosity of the Lockheed Company, has become, and in the future will become even more so, the world championship for light aircraft aerobatics and *voltige*. The nation that wins it will gain prestige which will reflect on its position in world aviation.

So far, British pilots have been unable to compete on anything like equal terms with the Continental pilots, particularly the French and the Czechs, mainly because we have had neither suitable aeroplanes, nor the opportunities for our pilots to practise.

Last year and the year before, however, there were signs that British pilots, given equal opportunities, could show themselves the equal of the foreign competitors. Our friend, Leon Biancotto, demonstrated that the "Bishop" adaptation of the famous Tiger Moth, well flown, can put up an exhibition which will take its pilots at least into the prize list.

This year, in addition to the "Bishop," the Tiger Club are acquiring another aeroplane which it is hoped will be an advance on the "Bishop," and which will be known as the "Archbishop."

The Tiger Club, too, has among its members a number of young and enthusiastic pilots who, given the opportunity to practise, could at least put up a respectable show and, in the coming years, perhaps acquire the knowledge and experience which will enable them to stand a chance of winning the trophy.

To reach the Lockheed Trophy standard of aerobatics requires study, application and continuous practice, but practising aerobatics is expensive, and individual pilots, unless they are in the R.A.F., have to pay for their flying.

I would like to make this appeal for assistance from some individual or some firm who would like to see this country begin to regain its old position in sporting flying. I know a number of young pilots who have it in them to be successful, and who are willing to spend their time practising, but who just cannot afford the cost.

Is anyone willing to help?

HERALD INTEREST.—During a visit to Handley Page's Radlett aerodrome, the Deputy Prime Minister of New Zealand, Mr. C. F. Skinner (right) flew in the Dart Herald. He was accompanied by his wife and Sir Frederick Handley Page.

Where are the Voltigists?

"VOLTIGE," our French dictionary informs us, means trick riding and similar circus gymnastics; the verb "voltiger" means to fly about, flit or hover. Mr. Norman Jones, whose letter appears above, has introduced this useful new word to cover the skilled handling of an aeroplane during competitive demonstrations of aerobatics. We shall not be surprised if it sticks.

However, Mr. Jones has drawn attention to something of much more immediate importance and that is how to develop for the good of the aeronautical fraternity the opportunity so foresightedly put in its hands by the bounty of the Lockheed Company. With the eclipse of the manned fighter, the young Service pilot is going to get increasingly fewer opportunities to develop his skill in aerobatics. The Lockheed Competition provides the inducement and the public occasion for competition in the art. As Mr. Jones says, what is now needed is some way of providing young men (and women) with the means to practise their skill.

If a private benefactor is not forthcoming could not some communal effort be organized?

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Napier Changes

THREE new appointments and a change on the board of D. Napier and Son, Ltd., were announced last week. Viscount Caldecote, D.S.C., A.M.I.Mech.E., A.M.I.E.E., A.F.R.Ae.S., becomes a new member of the Napier board. Sir John Paget, Bt., M.I.Mech.E., M.I.Prod.E., is another new member of the board and also becomes general manager of the whole Napier organization — hitherto he has been general manager of the company's London group of factories. Mr. A. J. Penn, O.B.E., M.I.Mech.E., F.R.Ae.S., has been appointed technical director—up to the present he has been chief engineer of the Aero Gas Turbine Division. And Sir Archibald Hope, Bt., O.B.E., D.F.C., A.C.A., a member of the Napier board since 1956, is now director of sales (air).

Top, Sir Archibald Hope, Bt., and Viscount Caldecote; bottom, Sir John Paget, Bt., and Mr. A. J. Penn.

Clearly, these appointments are intended to raise the status and to strengthen the design, production and sales organizations within the company. The appointment of Lord Caldecote to the board will also knit even more closely the ties that already exist between Napier and their parent company, for he is deputy managing director of the newly-formed English Electric Aviation. This executive re-organization at Acton would in fact seem to be a corollary of the recent English Electric moves (THE AEROPLANE for January 16) to integrate more closely the Group's aeronautical activities concerning manned aircraft and guided missiles.

Lightplanes at the Boat Show?

WRITING to the yachting Press, Mr. Eugene Prentice, of Harkstead, near Ipswich, has suggested that it would be an excellent idea if the British Gliding Association together with the Popular Flying Association could arrange with the Ship and Boat Builders National Federation to display such light aeroplanes as the Emeraude (or Linnet), the Jodel two-seater and the Turbulent at the next Boat Show. As he says, it is common knowledge that many commercial and Service pilots are keen yachtsmen but the reverse is not so much the case. He believes that the flying of sailplanes and light aeroplanes could with advantage be brought to the knowledge of the boat-minded fraternity.

This suggestion is a further example of a noticeable growth in the body of opinion which seeks to bring about an exhibition of light aeroplanes and is anxious to create new flying enthusiasts from the ranks of other sports. Bearing in mind the interest aroused at the last Boat Show but one by the Bensen Autogiro boat shown on the stand of Aero Research (as it then was) it may be that Mr. Prentice's proposal could prove fruitful. Many people, we imagine, will regret that it will be necessary to await another year before it comes off.

However, a start has to be made and there is no reason why a show of light aeroplanes could not be made earlier this year. An outdoor show is being staged by W. S. Shackleton, Ltd., at Kidlington on April 24, 25, 26, with the co-operation of the Goodhew Aviation Co., Ltd. We understand that besides the new British types to be on show, there will be some interesting visitors from the U.S. and Italy.

C.P.A. Across Canada

CANADIAN PACIFIC AIRLINES is to be authorized by the Canadian Air Transport Board to operate a service between Montreal and Vancouver via Toronto and Winnipeg. This decision follows a lengthy hearing of C.P.A.'s application for rights over five east-west routes in Canada.

Frequency of the service will be restricted initially to one flight a day, and C.P.A. will compete directly with T.C.A., which has hitherto had a monopoly of Canadian domestic operations. The other four routes for which C.P.A. applied would not, incidentally, have duplicated T.C.A. routes directly.

Guided Missilists

FOR the third time the College of Aeronautics at Cranfield has given a dinner and bidden guests to it for the purpose of meeting the members of a course on guided missiles. At this third dinner, held on January 16, guests learned that for the first time membership of the course had been open to representatives of other than NATO countries.

These dinners, as are the three other annual dinners, are extremely pleasant affairs and the distinguished speakers are deft in turning compliments and regaling their audience with anecdotes, not necessarily suitable for the printed page.

This year the largest contingent to the course comes from Germany with eleven representatives; India and the Netherlands and Sweden each have three and Italy and Norway have two. The Swiss member, Captain C. E. Grossenbacher, proposed the toast of the College and, as seems likely to become traditional for members of the course, made the speech of the evening.

In the most tactful way Captain Grossenbacher referred to the fact that the members of the course feel that it can be further improved. On the other hand his references made it equally clear that a course on such security-guarded things as guided missiles is bound to be a bit difficult to deal with.

Other speeches were made by Sir Frederick Handley Page, Mr. Stuart Scott-Hall and Professor G. A. Whitfield.

Frank Hillier

AS we go to press we learn with profound regret that Frank Norton Hillier, M.C., secretary-general of the Air League of the British Empire and editor of *Air Pictorial* from 1950 to 1957, died in hospital on January 25. He had been seriously ill for many months.

Frank Hillier was a familiar writer on aviation, foreign affairs and industrial relations, and while his death cannot have come as a surprise it marks the passing of another of the popular figures in aviation journalism.

Mike Hawthorn

THE LINK between motoring and flying has always been a close one, and it is not only in the motor-racing world that the death of Mike Hawthorn, on January 22 at the age of 29, is keenly felt. A private owner for some years, formerly keeping a Fairchild Argus and later a Vega Gull at Fair Oaks, he had recently announced his intention of taking up air racing; as an initial step he had just become a member of the Tiger Club.

As a member of the R.Ae.C. he was recently entertained as the 1958 World champion racing driver and in recognition of his promoting aviation by the practical use of his aircraft. There is little doubt that his technical ability and charm of manner would soon have established him as a popular member of the air-racing fraternity.

General Aviation News

FIAT AT FILTON.—This Bristol Orpheus-powered Fiat G.91 was flown into Filton on January 20 by Bristol test pilot Mike Webber for a short period of engine handling trials.

FUTURE FREIGHTERS. — On January 26 the Minister of Supply, Mr. Aubrey Jones, announced that the first order for the A.W.660 (between 20 and 30) would be placed within three months. Deliveries would begin in 1960. It was not intended to buy American strategic freighters. He expected the Minister of Defence to make an announcement about a long-range jet freighter.

SWALLOW DEVELOPMENT.—Negotiations with Vickers-Armstrongs and the American authorities are expected to be concluded soon for a joint research programme on the Wallis Swallow aircraft project. There will be some Government finance, but it is too early to decide the type of aircraft to which the principle might be applied. This was stated by the Minister of Supply, Mr. Aubrey Jones, on January 23.

IROQUOIS FACTS.—New data on the Orenda Engines Iroquois two-spool turbojet reveal it to have 10 compression and three turbine stages; a pressure-ratio of 8 : 1; a weight of 4,650 lb. and length of 231 in. (both with close-coupled afterburner); a diameter of 42 in. (47 in. at the afterburner); and an annular combustion system with 32 burners. Thrust is still "over 20,000 lb."—in fact, about 22,000 lb., or 28,000 lb. with afterburning.

HELICOPTER PRODUCTION.—By the beginning of this year the Sud-Aviation factory at La Courneuve had built 225 Alouette II helicopters, which have been supplied to the French armed forces and home and foreign civil operators. Djinn production totalled 125.

SWEDISH ALOUETTES.—Following the delivery of the first two S.E. Alouette helicopters of an order for eight for the Royal Swedish Navy, plans have now been completed for the Saab Aircraft Co. to build this type under licence. The first batch of 15 will be assembled at Norrköping mainly from parts made in France; more Swedish-built parts will be used in later series. The first Swedish-built aircraft is expected to fly in July.

A.E.I. GROUP.—In view of the magnitude of research development and production contracts placed with The British Thomson-Houston Co., Ltd., and Metropolitan-Vickers Electrical Co., Ltd., in connection with the Government Defence Projects, an A.E.I. Military Electronic Apparatus Group with headquarters at New Parks, Leicester, has been formed to co-ordinate and rationalize the two companies' activities in this field. Work undertaken by this Group includes development and manufacture of ground radar, certain types of airborne radar, IFF equipment, computers for military applications, position control servo-mechanisms, telemetry equipment, and a wide range of ancillary devices.

GERMAN F-84s.—A $14.5 million contract has been signed between Republic Aviation International, S.A., and the West German Ministry of Defence for the production of spare parts for the F-84F Thunderstreak and RF-84F Thunderflash now in service with the West German A.F.

ATOMIC GENERATOR.—The U.S. has produced a small nuclear generator which will provide electrical power for space vehicles. It weighs 5 lb. and produces 5 W. of power, losing about one-half its power potential every 138 days. About 1,450 lb. of conventional batteries would be needed to produce the same power as this generator over 276 days. It has been built by the Martin Co. and the Minnesota Mining and Manufacturing Co.

BOEING RECORDS.—Closed-circuit records set up by a Boeing KC-135 Stratotanker have recently been officially confirmed. They are: 2,000 km., 948.354 k.p.h. and 5,000 km., 944.907 k.p.h. Records set by a B-52D are: 5,000 km., 961.867 k.p.h., and 10,000 km., 902.369 k.p.h.

COMING ALONG.—Expected to fly in about two weeks is the 17-20-seat Max Holste M.H.250 Super Broussard. The first prototype has two 600-h.p. Pratt & Whitney R.1340 engines but the second aircraft will have two Turboméca Bastan turboprops.

NEXT WEEK

"THE AEROPLANE" dated February 6 will be a special Powerplants Number, containing features on all aspects of aircraft engines, including turbojets, turboprops and rockets; auxiliary power units and ramjets. There will also be tabulated data and a three-page "pull-out" of scale drawings of a selection of the World's gas-turbine engines.

The cost of this issue will be the usual 1s. 6d.

CANADAIR ROLL-OUT.—Canadair's first Model 540 twin-Eland transport was rolled out on January 19 and is shortly to start its flight trials. This, with a second to follow shortly, is a Convair 440 airframe converted by Canadair to 540 standard with Napier Eland powerplants. Both will be used by the R.C.A.F. until deliveries begin, later this year, of the ten Canadair 540s (CC-109s) ordered by the R.C.A.F.

HOUND DOG TRIALS.—A Boeing B-52 equipped with dummy missiles slung beneath the wing has successfully completed a series of flight tests to prove its missile-carrying capabilities. Resembling North American Aviation's GAM-77 Hound Dog ASM in weight and size, the dummies were carried beneath pylons mounted under the wing between the inboard engines and the fuselage. The test flights were conducted at Boeing's Seattle flight-test centre and at Eglin A.F.B., Florida.

CHINESE SPUTNIK?—It is reported that China hopes to launch a satellite during 1959 from a site in Sinkiang. This launching, which will rely on Russian assistance, is intended to demonstrate that China can match the scientific effort of the West.

NOSE-CONE RECOVERY.—An unofficial report from Honolulu says that U.S.A.F. C-119 aircraft have been practising the airborne recovery of missile nose-cones which are supported by parachutes. Experiments have been made over the Pacific using trailing grapnels and giant nylon nets for the recovery of dummy nose cones before they enter the sea.

PARIS AIR SHOW.—To date 230 exhibitors have booked space for the 23rd French International Air Show to be held at Le Bourget from June 12-21. At this show, which marks its 50th anniversary, 12 other countries besides France will be represented and by the erection of 32,290 sq. ft. of roofed-in enclosure 30% more covered space can be offered than in 1957. American exhibitors have asked for the provision of a water tank so that amphibious helicopters may be demonstrated.

SERVICE STOL.—The operational techniques of the five-seat Helio 395 Super Courier are being evaluated by the U.S.A.F. Designated L-28A, three of the type have been delivered to the Service.

Howard Levy photograph

INDEPENDENCE.—Hunting-Clan aircrews are operating this Bristol Britannia 317, owned by the British and Commonwealth Shipping Co., Ltd., which holds a half interest in Hunting-Clan Air Holdings.

Commercial Aviation Affairs

B.E.A. PLANS.—Among British European Airways' plans for the coming summer is the start of a new service between London and Klagenfurt, using Viscount 800s. The new high-density Viscount 701s will be introduced on the routes from London to Jersey, Dinard and Cologne/Hanover, and high-density Viscounts will also take over the internal German services.

ANOTHER VISCOUNT.—Sudan Airways has ordered a Viscount 810 for delivery in May this year. This is the 405th Viscount to be sold.

B.O.A.C. AND DECCA/DECTRA.—The position of the Flight Log in B.O.A.C.'s Comet 4s has not yet, we are informed by the Corporation, been decided—but it will not be on the central engine instrument panel, as suggested in the caption on p. 68 of the issue of January 16, and as positioned in the Ministry of Supply's Comet 2E (see p. 120, fifth paragraph).

JERSEY TERMINAL.—Work is to begin shortly on a privately-owned terminal building at St. Helier, Jersey. First stage of the project will be completed in May and later stages by the beginning of 1960.

FIRST F-27 FOR T.A.A.—On January 19 the first of Trans-Australia Airlines' Fokker F-27 Friendships ("Dirk Hartog") made its initial flight at Schiphol. T.A.A. has 12 F-27s on order and this is the seventh aircraft from the Fokker production line.

VIKING TO EGYPT.—A Viking of Overseas Aviation (C.I.), Ltd., made, in the first week of January, what is believed to be the first charter flight by a British-registered aircraft to Egypt since the Suez crisis. It carried a party of Germans from West Berlin to Cairo and Luxor.

INSPECTION.—On January 23 Lord Brabazon was shown around the interior of the prototype Vickers Vanguard by (left) Mr. A. Greenwood, deputy general manager of Vickers-Armstrongs (Aircraft), Ltd. Pictures of the Vanguard's first flight are on pp. 126-127. At the time of going to press, three test flights had been made, totalling 3 hr. 8 mins. of airborne time.

AMERICAN 707 SERVICE.—On January 25, American Airlines put their Boeing 707-123s into daily service on their New York-Los Angeles route. This is the first transcontinental turbojet service in the U.S.A.

TU-104 CHARTER.—Two British travel agents, Sir Henry Lunn and Horizon Holidays, have arranged to charter Aeroflot Tu-104s for inclusive tour flights to and from the U.S.S.R. If this aircraft is not, by the time the tours start, permitted to use London Airport, Stansted or, possibly, Gatwick may be used. A similar arrangement was planned last year by Horizon Holidays (see the issue of May 9, 1958, p. 641).

RANGER FOR ANSETT.—A five-seat Bell Ranger (47J) has been added to the three-unit helicopter fleet of Ansett/A.N.A. The cabin is arranged so that two stretchers can alternatively be fitted for ambulance work.

ITALIAN HELICOPTER COMPANY.—Linee Aeree Siciliane (L.A.S.) has been founded in Sicily as a joint Italian/American venture to operate a scheduled passenger helicopter service between the main towns and tourist resorts of Sicily. The company plans to have six Sikorsky S-58 helicopters in use by the end of next year.

NO CARAVELLES FOR BUTLER.—Plans by Mr. Arthur Butler for a service between Melbourne and Sydney, using six S-A Caravelles, have been vetoed by the Department of Civil Aviation, which has refused import permission. In a letter to Mr. Butler, the D.G.C.A. said the domestic airways network would not be capable of handling turbojet aircraft on the scale contemplated in the application, until late 1962, and possibly not before 1965.

MORE ELECTRA CARGO.—International models of the Lockheed Electra can have alternative additional cargo space in the forward passenger compartment, giving a combined cargo-baggage capacity of 11,360 lb. when the aircraft is flown on routes where passenger loads are less than normal. The modification, for which conversion kits are supplied, involves a weight penalty of only 208 lb. when allowance is made for the removal of the unwanted seats.

K.L.M. AND SINGAPORE.—The date on which K.L.M.'s terminal traffic rights at Singapore will be reduced to one service weekly (see last w k's issue, p. 88) has been postponed for a month—until February 28—in order to permit discussions to be completed.

EL AL TO SOUTH AFRICA.—After a break of two years, El Al Israel Airlines is restarting weekly scheduled services between Tel Aviv and Johannesburg, using, it is reported from Cape Town, DC-6Bs chartered from Sabena.

AIR JORDAN LOSS.—On the night of January 22 an Air Jordan aircraft, believed to be a DC-3, crashed near Amman. Nine of the 17 people on board, including Mr. Peter Burgess, of the Shell Company, lost their lives.

THE MUNICH ACCIDENT.—BALPA'S Technical Committee's Accident Study Group has concluded that the accident to the B.E.A. Elizabethan at Munich was due to "some extraneous force"—probably slush on the runway—and that ice accretion on the aircraft could not be admitted as a possible cause. After approval by the Association's Executive Council the conclusions are to be submitted to the B.E.A. Air Safety Committee. A report on the accident inquiry has yet to be issued by the German authorities.

MORE NEWS ON P. 134

Air Transport

Viscount Economy

FIGURES prepared by Continental Airlines at the end of six months' operation of their Vickers Viscount 812s provide a useful measure of this aircraft's operating economy. The actual values of aircraft-mile and seat-mile costs recorded by Continental—respectively 71.33 cents and 1.40 cents—are less important than the fact that the Viscount proved more economical than any of the other types in the Continental fleet.

A comparison of this kind, in which the DC-3, Convair 340 and 440, DC-6 and DC-7 were all measured by the airline's particular yardstick when subjected to identical types of operation, is a much more useful one than the more usual theoretical assessments of aircraft economy which form the basis of most manufacturers' claims. Vickers, as well as Continental, can be well pleased by the fact that the Viscount aircraft-mile costs were nearly 11 cents below budget and the seat-mile costs were .21 cents below. Of the other types in service, only the DC-3 had a cheaper aircraft-mile cost, but the seat-mile costs of the smaller aeroplane were almost double those of the Viscount.

Reports of Viscount profitability and reliability are commonplace, but two recent ones are worth recording. In the first 18 months of operation, the two Viscounts of Hong Kong Airways suffered only nine delayed or cancelled flights out of 1,260 scheduled—and these were mostly due to a typhoon. Percentage regularity was 99.286%; on the Hong Kong-Tokyo route not one arrival was late; and in some 7,000 flying hours, no engine has ever had to be feathered.

TACA International Airlines has been flying its sole Viscount between New Orleans and Guatemala City, San Salvador, Mexico City, and Managua. For 10 months this Viscount flew 2,418 miles a day, six days a week, averaging 195 hours and 113 landings a month. In that time, only three services were cancelled.

The Low-Fare Bids

THE expected resistance to Eagle Aviation's proposed very low-fare operations has begun to develop. B.E.A. lodged an official objection just before the end of the year to the Cyprus application and B.O.A.C. has since lodged an objection with the Aden Air Transport Licensing Authority to the London-Aden-Singapore application.

B.E.A.'s objections were to the effect that the Corporation and Cyprus Airways already served the area; that the new service would materially divert traffic and result in an undermining of the international fare structure in the area; and that the Corporation's low-fare development plans would be prejudiced. This last presumably refers to the tourist-fare reductions proposed by B.E.A. at the IATA traffic conferences. B.O.A.C.'s objection was to the diversion of traffic.

Eagle's low-fare plans were outlined in the issue of December 19 (p. 881) and more details and comments appeared in the issue of December 26 (p. 923). Applications have been made for low-frequency (weekly, fortnightly and monthly) services over seven trunk routes and to and from 11 colonial points at fares about half those at present charged.

Inevitably, doubts have been expressed in various quarters about the validity of the economics of the proposed operations and about Eagle's ability to operate the services. In a circular letter sent out last week, Eagle covers many of the points in doubt. This letter first explains that the company's overheads are low, that the proposed types of aircraft (DC-6Cs for instance) are such that, over the routes proposed, a load-factor of less than 70% would permit the operators to break even, and that the low frequencies would ensure a high load factor. Eagle claims, on its present experience, that the services, at the frequencies planned, could be operated with a fleet of only three large aircraft. Because the fares are so low a new type of traveller will be attracted and traffic will not, therefore, be " materially diverted " from existing services.

The fact that the proposals are not in any way a " stunt " is shown by the efforts already made by Eagle to interest and inform overseas authorities. Five Eagle directors and two senior executives have already visited the directors of civil aviation or appropriate authorities at eight of the 11 points where traffic rights for the services would be required.

The Market Expands

AN expansion of both offers and bids is evident in the second *Market Report* issued by Aircraft Exchange. This expansion is reflected in the addition of various older types of aircraft to the list of those on offer—such as Convair PBY-5A Catalina amphibians and Fairchild C-82s—and in the number of bids.

A new feature of the *Market Report* is the inclusion of actual price quotations (slightly " rounded ") as well as adjusted prices which take account of the overhaul status of the aircraft.

Most offers, as might be expected, continue to be concerned with Douglas aeroplanes, and for the most part the aircraft are for immediate sale. A wide scatter of prices is still shown; for instance, one Catalina is offered for $27,000 (adjusted, $5,000), and another for $295,000—although the latter is an executive aircraft with many improvements. On an adjusted price basis, DC-3s are available for as little as $40,000, and range up to $250,000 for an executive type. Highest price asked in this report is $740,000 each (adjusted, $680,000), for three L-1049G Super Constellations.

ON TEST.—This first air-to-air picture of the Boeing 707-321 Intercontinental shows that it cannot easily be distinguished from the smaller 707-120—other than by the name on the fuselage and the number of windows. One of 23 ordered by Pan-American Airways, this 707-321 is scheduled for delivery later this year, after the completion of certification trials.

Demonstrating Decca/Dectra for ICAO

SINCE the publication of our previous issue, which contained a report on the views and aims that the United Kingdom is to put forward at the ICAO navaids conference in Montreal next month, the first of a series of international Decca/Dectra demonstrations have been completed in this country. Organized by M.T.C.A. using a M.o.S. Comet 2E, these demonstrations are to include three Decca/Dectra flights of approximately 8 hr. endurance and one 3-hr. Decca Mk. 10 flight from Montreal during the special navaids meeting.

Made within the cover of the English and South-West British Decca Mk. 10 chains, the U.K. demonstration flights (of approximately 2½-hr. duration) only showed the use and operation of the Decca Navigator in a high-speed transport, but the three 8-hr. flights from Montreal will include a 300-mile trip out over the Western Atlantic under Dectra cover.

Operated from London, the U.K. demonstrations of the equipment were designed to show a climb on track out of L.A.P. via Airway Green One to Tuskar Rock, then a direct leg to the Exeter area, and, joining the airways again at Hurn, back to L.A.P.

On reaching the Bristol area on the outward leg a change from the English to S.W. British chains was made at 40,000 ft. and this cover was used to Tuskar Rock. A chart, based on the English chain, for an Exeter terminal area, was drawn for the demonstrations and a change back to this chain was made in the area of Bishop Rock (220 n. miles from English master station), followed by a high-level holding pattern demonstration from 34,000 ft. down to 20,000 ft. over Lundy Island. After a final let-down and overshoot at Exeter, the flights included a climb back to height and a final high-level holding pattern demonstration (nominally over the Watford range) before an approach and landing at L.A.P.

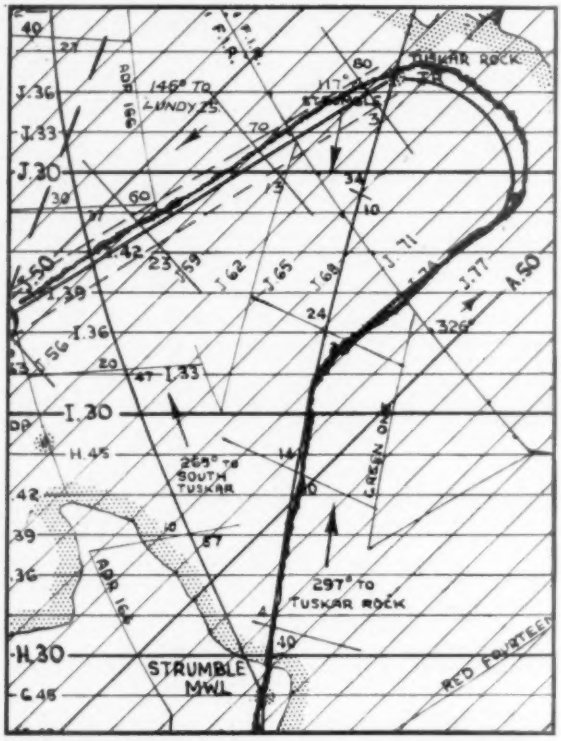
Apart from the Decca/Dectra Flight log in the control cabin, the Comet 2E installation includes four Flight Log displays in a console in the main cabin. To accommodate the Flight Log in the control cabin, on the panel above the central throttle pedestal, the four engine power-loss indicators have been transferred to the engineer's position.

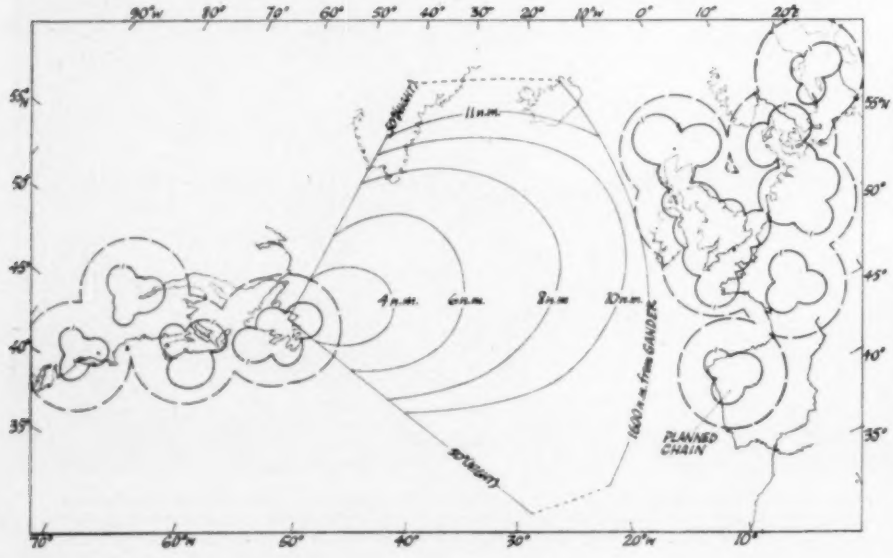
During the steep climb out of L.A.P. along Airway Green One (30,000 ft. was reached before Lyneham) on the second of the demonstration flights the actual flight path was within ±0.5 n. miles of the intended track. Chain changes were normally completed within 30-35 sec., and direction changes were limited to Rate ½ turns (20° of bank at 300 knots) for passenger comfort. A section of the actual flight chart is reproduced opposite.

Commenting on the U.K. policy in relation to short-range navigation, Mr. B. P. Wood (M.T.C.A. signals officer) said that much co-ordination and communication work could be dispensed with by the methodical use of well-designed air route structures. One step in this direction would be the provision of one-way airways and another the establishment of procedural crossings which eliminate the need for co-ordination of crossing traffic by ATC. Procedural crossings could be established with improved navaids and it would only be necessary for the aircraft in the crossing streams to be held level during the cross-over. The idea of procedural crossings is not new and the principle is in limited application in the United States at the present time, but the navaids in general use are neither adequate nor accurate enough for its development to a worthwhile extent.

With regard to some of the desirable features that are lacking in Decca, such as left/right needle indication for

(Continued on page 121)



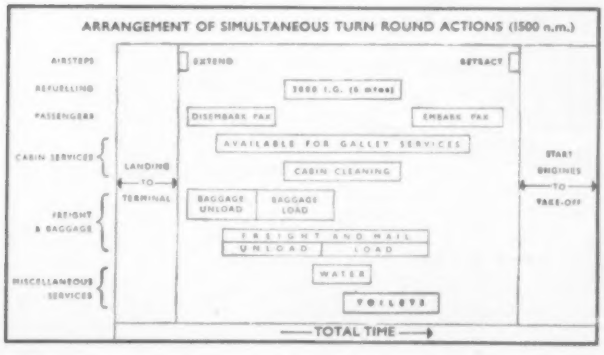


Above, a section of the actual Decca chart used during the second U.K. Decca Mk. 10 demonstration in a Comet 2E showing the track recorded by the Flight Log. On this scale the maximum deviation from the intended track is approximately 1 n. mile.

Left, chart showing the areas covered by the North American and West European Decca Navigator chains and the North Atlantic Dectra system. The broken circles indicate the limit of useful Decca fixing cover and the Dectra contours show the system's operational track-keeping accuracy in the worst direction at standard deviation.

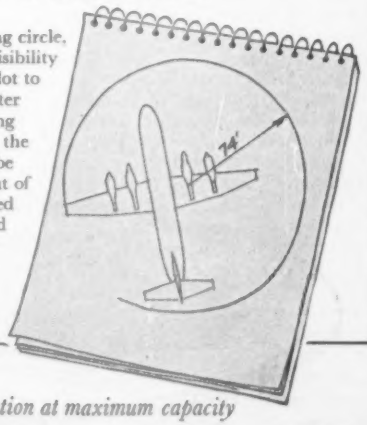
Yes, with the VANGUARD

Special design features of the Vickers VANGUARD cut time on the ground — and therefore operating costs — to a minimum. Cabin doors fore and aft, with built-in folding stairs, ensure rapid passenger handling. With their wide doors, the capacious freight holds permit simultaneous loading and unloading, and the large floor area allows spacing out of individual packages for rapid unloading at successive stops. All services are readily accessible, and the actual pressure re-fuelling for a 1,500-mile flight takes only six minutes. With its low tyre pressures, the VANGUARD does not have to wait to use a particular part of the apron. All this gives the VANGUARD more time where it should be — in the air! *It's the airline's airliner.*



For your notebook . . .

Minimal turning circle, and excellent visibility enabling the pilot to see both the outer engines and wing tips, mean that the VANGUARD can be taken in and out of the most crowded apron safely and quickly.



Maximum utilisation at maximum capacity

VICKERS VANGUARD

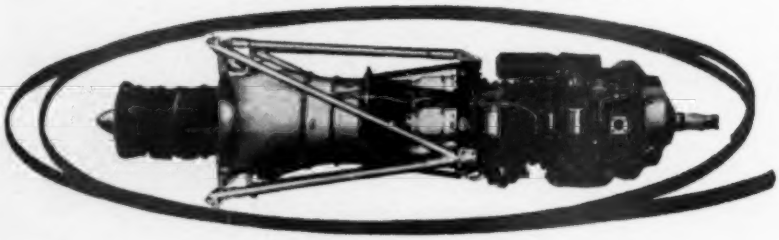
Four Rolls-Royce Tyne Propeller-Turbine Engines

VICKERS-ARMSTRONGS (Aircraft) LIMITED WEYBRIDGE SURREY
TGA AT529

D

NAPIER ELAND TURBO-PROP ENGINES POWER THE FAIREY ROTODYNE

WORLD'S FIRST VERTICAL TAKE-OFF AIRLINER



STOP PRESS

Eland powered Rotodyne covers 100-km. Closed Circuit at 190.9 m.p.h. establishing first speed record in new "Convertiplane" class and exceeding world's absolute speed record for rotocraft by 29 m.p.h.

(Subject to Official Confirmation.)

NAPIER **Eland** *turbo-prop* D. NAPIER AND SON LIMITED, LONDON, W.3.

A Member of The ENGLISH ELECTRIC Aviation Group

CRC E36R

(*Continued from page 120*)

track-following and the ability to couple the navigation aid to the autopilot to produce the automatic track-following capability, Mr. Wood remarked that, if the aid had been accepted earlier as a standard, these would be available now. As it is, they are in the process of development.

On the economic side, for a given traffic complex, such as the Golden Triangle (New York, Washington and Chicago) and areas of North-west Europe, the advantage of Decca is significant. For considerably less capital cost and about half the recurrent cost of VOR/DMET, Decca will provide double the number of airways in the same amount of airspace. Moreover, airway development can be continued within Decca cover until all the airspace is used without further expenditure on ground aids, their sites and their services.

From the operational point of view, Mr. H. Keeling (M.T.C.A. operations officer, navigation aids) stressed that to achieve a high Decca track-keeping accuracy, expressed as a standard deviation, the correct minimum chart scales must be used. The quality of distance measurement on the Flight Log, provided to fixed-wing aircraft by the Mk. 10 system out to about 200 n. miles range in front cover of the English Chain, is not worse than ±1 n. mile, standard deviation, in summer night conditions (the worst except for 8% of the year). In helicopters the Mk. 8 Decca receiver and Flight Log had proved itself capable in the more accurate parts of the chain-cover of providing approach guidance down to limits of 250 yd. approach visibility and break-off heights of 250 ft.

Within that portion of the cover of any single Decca chain where the operational track-keeping accuracy has a standard deviation of ±1 n. mile, or less, the specific ATC requirement laid down by the U.K., for two tracks in any airway 11 n. miles wide or three tracks in an airway 18 n. miles wide, can be met if Decca is used as the basic navigation tool. In a twin-track airway of 11 n. miles width, the two tracks to be flown would be 2 n. miles from the airway edge, placing them 7 n. miles apart.

With regard to the Dectra System, the evaluation of which started in May, 1957, and is still continuing with Valiant, Comet and Hastings aircraft, it has been possible to assess the quantity and quality of operational service provided and the diagram on page 120 serves to indicate the area of reliable cover and contours of track-keeping accuracies, expressed as a standard deviation, when using the Flight Log presentation.

From the evaluation results of the system so far it has been found that the continuous position information of the improved quality required by ATC is available, and, if current trials are successful, the means of transmitting this information direct to ATC could be incorporated into the Dectra system.

But, for all this, it seems unlikely that any major agreement on Decca/Dectra will come out of the Montreal navaid meeting. The United States has invested something of the order of $600-1,000 million in its VOR/DMET system for installation in various parts of the World, and is expected to oppose strongly the U.K. proposal that the Decca Navigator should be adopted by ICAO as a standard international short-range radio-navigation aid.—P.R.R.

Airline Rates Policy

FORMATION of price (fare) policy by airline managements has lacked, in the past, the systematic and continuing attention of senior management executives which is, for instance, lavished on the problems of re-equipment. This situation, in the view of Professor Paul W. Cherington, is indefensible and must be improved in the future if the airlines are to continue with the profitable expansion which, in general, has characterized their history to date.

Criticism of top management attitude towards pricing policy is one of the main themes of Prof. Cherington's recently published study.* Prof. Cherington is Associate Professor of Business Administration at the Graduate School of Business Administration, Harvard University, and his study of airline price policy was initiated in 1950 as one of a series of studies by the School into business aspects of aviation. Before going to Harvard, Prof. Cherington was with the C.A.B. in Washington. Last year, his report to the President's Special Assistant for Aviation on the economic significance of the airliner re-equipment programme drew widespread attention and comment.

For his study of airline price policy, Prof. Cherington has concerned himself only with the U.S. domestic trunklines, but this does not deprive his book of interest, nor his findings of relevance, in a wider application. It seems certain that airlines throughout the World have been guilty of the mistakes shown up by this study, and could well heed the conclusions and recommendations, even though they do not work under the regulatory influence of the C.A.B., which comes in for close scrutiny by the author.

The chapter entitled "The Regulatory Environment" is, in fact, one of the most interesting parts of the book for the more general reader, as it traces the evolution of C.A.B. thinking on fares policy and explains how the Board fulfills its statutory obligations. Much of general interest will also be found in a chapter studying in great detail the development of coach fares in the U.S.A.

From studies of many particular cases over the past 10 years or so, Professor Cherington shows how the airlines have priced the "perishable commodity" (seat-miles) which they market, to meet fluctuating conditions. Pricing actions can be broadly divided into those aimed at small market segments (e.g., excursion fares on specified routes); those for major market segments (e.g. coach fares, family plan fares); those designed for competitive selling (e.g., round-trip discounts) and those intended to increase the unit revenue (e.g., individual-airline increases or changes in fares structure).

The cases tend to show that most pricing actions, upward or downward, are based largely on the "feel" of the market by certain individuals in the airline, rather than on solid analysis of the available market, likely cost to the airline and other factors. Conducting such an analysis is far from easy, but should be the basis for fare changes in the future—although the actions taken in the past appear usually to have been proved correct. Just how correct fare revisions have been is usually difficult to assess, not least because the cost of providing a new or modified service can hardly ever be accurately measured in relation to the airline's overall costs.

So far as the C.A.B. is concerned, Prof. Cherington concludes that its role in airline pricing has usually been indirect and negative; only rarely has the Board initiated a fare change. As "watchdogs" over the public's interest the C.A.B. staff should at least sample the public's wishes and opinions before opposing airline proposals, and a continuing programme of staff or outside studies should be pursued, covering such general and technical questions as depreciation periods, capital requirements and measurement of demand elasticity.

There seems to be no real evidence that the general level of U.S. domestic fares is correct for the available traffic—in this respect a conclusion to the C.A.B.'s General Passenger Fare Investigation, instituted in 1952, discussed in 1953, reinstituted in 1956 and postponed until August, 1957, is long overdue. However, assuming that the general level is broadly right, the major future growth of the industry lies in adjustments to the fares structure, to provide a proper relationship of service differential and price differential. The advent of turbojet transports will compound the problem of achieving the proper "mix," and it may be that at least three fare levels will be required: first-class, regular coach and off-peak coach.

In the short-haul field, where it is impossible to charge fares based on fully allocated costs, a new type of service might be developed for high traffic-density routes, using aircraft with high-density seating, frequent schedules, no prior reservations and streamlined ticketing and ground handling procedures.

The need to reassess fare structures is underlined by the steady improvement of coach-class service.

On the present thorny question of differential fares for turbojets, Prof. Cherington remains silent, except by implications. The study recalls, however, a fact which may have been generally forgotten—that a 10% fare surcharge was levied in the U.S.A. on passengers using new four-engined post-War equipment (the DC-6 and Constellation) in the period 1947-48. The reasons for the fare differential then can hardly be likened to the arguments now being advanced, but it is interesting to note that these temporary surcharges seem to have had no harmful effects on revenues.

* "Airline Price Policy," by Professor Paul W. Cherington, 490 pp. including 77 tables. Published by the Harvard Business School, Soldiers Field, Boston 63, Massachusetts, price $7.50. U.K. Agents, Bailey Bros. and Swinfen, Ltd., Hyde House, W. Central Street, London, W.C.1.

Irish Air Lines Consolidation

—H. A. Taylor discusses New Equipment and Future Plans

North Atlantic Prospects Considered

THE introduction into service of the F-27 Friendship is just one more event in the interesting (and sometimes chequered) history of Aer Lingus—which, like its long-haul sister company, Aerlinte Eireann, is tending nowadays to be given the rather more practical, but regrettably prosaic, English-language title of Irish Air Lines.

Except for natural curiosity about the reasons for the fact that Aer Lingus is the first European operator to find an important part for the Friendship to play, as an aircraft designed to the new short-haul formula, there might be no reason to do more than to raise an eyebrow. The interesting points are, however, that the purchase of this aircraft was part of an overall plan of equipment standardization; that the decision was only one in this plan; and that a relatively small airline may find it both possible and expedient to make even more interesting equipment purchases and route decisions in the not-too-distant future.

History, as Mr. Henry Ford is reputed to have said, may be "bunk," and, despite the proverb, it rarely repeats itself; but there may be an odd repetition of history during the next two years so far as Irish Air Lines are concerned. Way back in 1947 Aer Lingus (or, more exactly, Aerlinte Eireann) decided to go into the North Atlantic operating business. Five Constellations were bought and training and proving flights were completed, but an adverse political decision caused the project to be dropped and the North Atlantic services, planned for the spring of 1948, were not started.

Nobody knows what the future might have been if those services had been started and continued. All that can be said is that, thanks to the equipment shortages of the period, the profit on the sale of the Constellations very much more than paid for the costs of the abortive introductory programme, and that, though operating problems and competition were much less severe in those days, Irish Air Lines are now a great deal more maturely capable of tackling a similar proposition than they were in 1948.

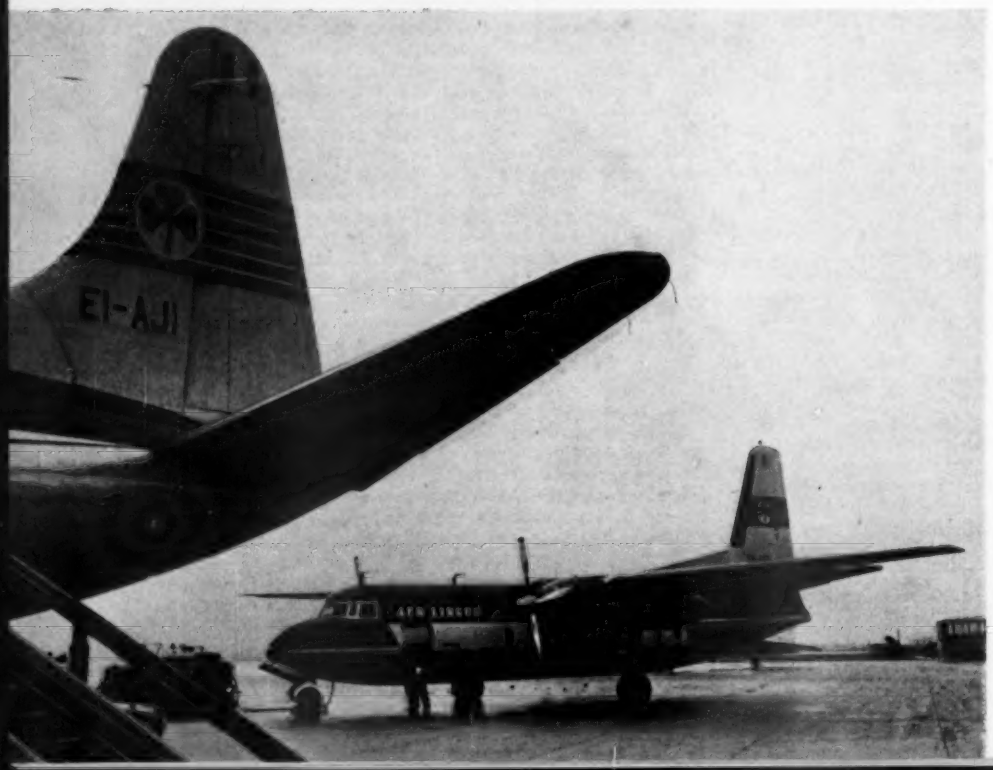
It would appear, in fact, that history may be about to repeat itself in its usually slightly different form and that Aerlinte Eireann may be operating its own North Atlantic services by the summer of 1961. A decision will need to be made during the next month or two if equipment is to be ordered for delivery, and training completed, in time to make a competitive success of services in continuation of those at present being operated for the Irish company by Seaboard and Western Airlines with L-1049Hs.

These services were started on April 28 last year as an all-economy-class operation and have been very reasonably successful. Load factors, though low by normal standards, have been much higher than the minimum average set as a target when considering the prospects of self-contained operations with equipment more suited to the demands of the 1960s. Coupled with the prospects of direct tourist traffic for Ireland and with those of passengers who might like to make a start in Ireland and to continue on to Europe without backtracking, the results of the first nine months of lease operations have been encouraging enough to give the plan for a national North Atlantic service a much better than 50-50 chance of final approval.

Another reason for a fairly quick decision is concerned with the fact that the American C.A.B. is not likely to permit Seaboard to operate the Aerlinte services for much more than two years unless it is clearly understood that Aerlinte will itself take over the services in due course. If a decision to go into the North Atlantic business is made, the C.A.B. will undoubtedly permit the present arrangement to continue up to the moment when the Irish company starts its own operations.

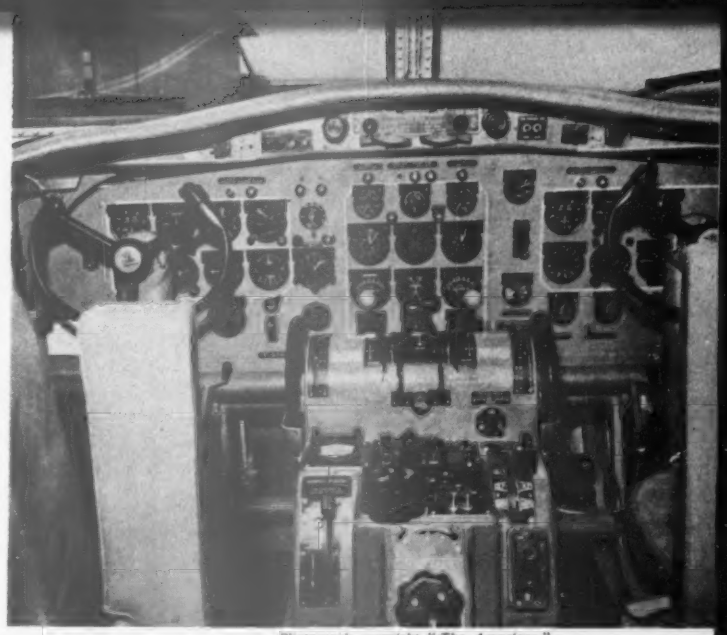
If a favourable decision is made, what kind of equipment will Aerlinte use for its services? Obviously, if it is to be competitive on its relatively small scale, fairly large-capacity turbojets will have to be used. Shannon Airport is 320 nautical miles nearer to New York than, say, London, and the traffic problems there are not likely to be as great as they will be around other European centres. A so-called medium turbojet is the obvious choice. For delivery late next year a decision will probably need to be made between variants of the Convair 880, the Boeing 720 and the Comet 4.

By way of postscript to this first of three sections in the



The F-27 Friendship at London Airport on January 13 with, in the foreground, the tail of one of the three Viscount 808s which have been in service with Aer Lingus since 1957. Three more 808s and F-27s are now being delivered.

Photograph copyright "The Aeroplane"



Photograph copyright "The Aeroplane"

The control cabin of the Aer Lingus F-27 which has a tidy and relatively simple layout. The emergency reserve horizon (see text) can be seen on the top right of the captain's flight panel. The two high-pressure cock controls are safely separated on either side of the throttles.

discussion of Irish Air Lines it might be as well to offer a brief and oversimplified explanation of their present set-up. The holding company is Aer Rianta, which is the agent for the Minister of Industry and Commerce in the general encouragement of aviation in Ireland, and which manages Dublin Airport at Collinstown. Aer Rianta now owns 95.4% of the issued share capital of Aer Lingus, and, at present, all the capital of Aerlinte Eireann.

Aer Lingus, which was formed in 1936, is the principal operating subsidiary of Aer Rianta, by which it was wholly owned from 1937 until 1946, when holdings were taken by B.E.A. (30%) and B.O.A.C. (10%) following a bilateral service agreement; B.O.A.C.'s shares were taken over by B.E.A. in 1952. In 1956 the agreement was revised, permitting B.E.A. and other British operators to compete on the Dublin-London and certain other U.K.-Ireland routes in exchange for continental traffic rights through Manchester and reducing B.E.A.'s holding to 10% of the capital at that time. This holding, following an increase in capital, is now 4.6%.

Aerlinte Eireann was originally formed in 1947 to operate North Atlantic services. After the decision was made to drop this project the company continued to exist as, so to speak, an Atlantic study group. An agreement was reached with Seaboard in 1952 for leased-aircraft operations in 1953, but the plans were again deferred and these operations were not started until 1958. C.A.B. approval is awaited for the agreed investment by Seaboard of £500,000 (a 25% holding) in Aerlinte.

Training the Friendship Pilots

THE Friendship may, as suggested in last week's issue, give a big-aeroplane impression to its passengers, but its flight crew, on the other hand, enjoy the happy impression of being in charge of something relatively small and simple. This is mainly due to the depth and extent of the fenestration in the control cabin, to the nearness to the runway surface whilst earthbound and to the comparative simplicity of the instrument and control layout.

Even a jump-seat observer who has not been in sole charge of a full-sized aeroplane for more than a decade obtains the impression that he could make a reasonably successful attempt to take the F-27 off and to land it again, and a short period in the second pilot's seat tends to confirm this impression.

An airline pilot's comments on the F-27 were published in THE AEROPLANE of August 8, pp. 203-206, so the remarks here can be no more than an *aide-mémoire* coupled with some supplementary information after experience of a production aircraft now in service.

After take-off check, lining-up and control-lock release, the Darts are opened up to take-off power on the brakes while the oil temperatures, revolutions (on initially disturbing two-needle dials like altimeters), jet-pipe temperatures and torque readings are checked. The nosewheel steering control is used to keep the aircraft straight up to about 40 knots plus, when full rudder control is available. When the Friendship is lifted off at V2 (90 knots plus) it settles firmly, and without hesitation, into its initial climb.

Training-flight stall exercises showed that, in the clean configuration, there was a very adequate buffet warning (so much so that one hated to think about the rivets in the tailplane) and no very noticeable desire on the part of the aircraft to do anything much more than sink on a level keel. Eventually, with the control columns held in the pilots' stomachs, the starboard wing dropped away. With undercarriage and flaps down there is little natural stall-warning; a stick-shaker is fitted to meet the full-flap stalled-turn case.

The elevator and rudder trim wheels strike the newcomer as being a little on the sensitive side—but, in the case of the rudder trim, this is a considerable advantage when an engine is cut. Very little retrimming movement is necessary to keep the slip needle central and, apart from the steady drop in speed and the shadow, maybe, of a slowly revolving feathered propeller, there is little to show that one is now conducting an asymmetrically powered single-engined aircraft.

Let-downs are best made at 180 knots I.A.S.—only a 10-knot speed reduction is then necessary before undercarriage lowering—and maintaining a descent-rate of about 1,000 ft./min. The F-27's natural circuit and initial approach speeds are similar to those of the DC-3 (about 120 knots), but may normally be higher for the benefit of the air traffic controllers. Base-leg and initial final approach speeds and descent-rates appear to be held satisfactorily with 25° of flap and 100 p.s.i. of torque, and these settings are such that any overshoot actions can be taken immediately.

The recommended final approach speed is the target threshold speed plus 15 knots—say, 90-105 knots according to weight and conditions. Power can be reduced from 100 p.s.i. to lose excess height before full flap is selected and the throttles cut to give a 75-90-knot hold-off speed over the threshold. If the speed is on the high side the Friendship floats quietly along without showing much sign of settling—but without using very much runway either. Once down, ground-fine-pitch provides effective initial deceleration. In the F-27, which is C.A.A.-certificated, this propeller-fining is manually selected—by lifting the throttle levers and pulling them back into an "override" closed position.

Apart from the very pleasingly light, but not too light, aileron control, one of the more attractive features of the Friendship for the pilot is the feeling that he can really see out—even when making a turn away from the side on which he is sitting. Because the windshield is deep, V-shaped and relatively near, the pilot has the feeling that he can "see round the corner" while initiating a turn and that most of the forward hemisphere is under inspection. Quite an illusion, of course, but a pleasant one bred by experience in the more claustrophobic control-cabin environments of so many modern pressurized aeroplanes.

The flight-deck layout of the Aer Lingus F-27 seems to be nearly all that a two-crew arrangement should be. The controls for the VHF, twin VOR and ADF are in the roof panel, but their position is such that their use does not involve violent neck contortions. Nearly all controls and switches, and certainly the essential ones, can be reached from the captain's position and the aircraft is, in fact, certificated for operation by either two pilots, or by a pilot and a flight engineer. The only control which seems, to the onlooker, to be awkward is that for the control-surface lock, which is behind the captain.

The flight deck is wide and the use of a single pair of throttles involves a longish reach, but turboprop throttles (if so they may be termed) cannot be used satisfactorily for ground control, or differentially on take-off, in the way in which piston-engine throttles were handled before the advent of nosewheel steering, so very high standards of convenience are of little importance.

As explained in the next section of this article, the Aer Lingus F-27 is equipped with a Collins autopilot as well as with the Collins flight-instrument system so that, in addition to total standardization in basic fleet instrumentation, there is an increasing degree of standardization in ancillary equipment manufacturing sources. By way of emergency means of orientation after major electrical failure there is, in the captain's flight panel, a reserve artificial horizon, which is fed from a selected basic source of alternator power, as well as the usual standby miniature magnetic compass.

All the Aer Lingus pilots will, in due course, be passed out on the F-27. The initial group of captains and first officers for the aircraft have been ex-Viscount—because of their necessarily wider experience and because the previous handling of Dart engines and the acceptance of tricycle techniques has meant that training times could be kept to a minimum. In fact, though the curriculum of conversion air training for Viscount pilots is planned at 5-5½ hours, the time in practice is usually much lower than this. The DC-3 pilots, who will be coming through later, are expected to complete their air training in about eight hours.

There are eight successive exercises (including instrument

The Friendship on the apron at Dublin's Collinstown airport, with the familiar terminal building in the background.

rating tests) in the planned course. Only two trainees are taken up together so that, with one in the left- or right-hand seat and the other watching from the jump seat, there is no boring and time-wasting period of waiting in the passenger cabin. The exercises start with the usual general handling experience, stall demonstrations and emergency drills, and continue through single-engine air and take-off experience, accelerate-stops, cross-wind work, flight system and ILS practice, and night flying.

After completing the technical and flying courses, prospective captains fly first as a supernumerary, then on co-pilot trips and finally on trips as captain with a check captain in the right-hand seat.

Equipment and Traffic Problems

NO airline could suffer much more than Aer Lingus from peak-trough traffic problems. Not only are there the normal seasonal variations in traffic, but there are multiple peaks and troughs within the major variations, as well as severe directional traffic-flow problems. So, almost from the start of serious post-war operations, Aer Lingus has had to play complicated games with excursion, night-time, winter and directional fares in order to keep the traffic-increase curve rising.

The success of these devices is evident from the way in which passenger traffic has increased from a little over 150,000, in the first post-war year of really full-scale operations with a reasonably well-integrated fleet, to something over 500,000 in the calendar year 1958. In fact, the only period in which passenger numbers dropped slightly was in 1957-58 after the loss of the exclusive traffic rights between the U.K. and Ireland.

Freight and mail loads have, too, increased in the same period from some 900 tons to about 9,000 tons. The biggest jump was in 1951-52, when all first-class mail started to be flown between the two countries and when the efforts to obtain more fill-up and regular-service freight were beginning to show real dividends. For the past 10 years, incidentally, Aer Lingus has been flying every week the major part of a 40-ton load of Sunday newspapers from Manchester to Dublin, using, at present, Viscounts and DC-3s.

All this has a very obvious and direct bearing on the present composition of the Aer Lingus fleet and on the way in which the company was the first, outside the U.K., to order Viscounts and the first, outside Holland, to buy the Fokker Friendship. In earlier days the battle was for traffic; now the battle is for traffic against direct competition.

When the U.K.-Ireland bilateral agreement was revised in 1956 Aer Lingus saw that it would be necessary to develop Continental services and longer-haul services generally, as well as to compete effectively on the Continental runs and on the short-haul, limited-traffic services to and from provincial centres in the U.K. The DC-3s could not for ever be used competitively on the limited-traffic services and an all-Viscount fleet was not an economic proposition with peak/trough traffic difficulties and the need to offer useful frequencies. At the best the F-27 will do a far better job than the DC-3 and at the worst it is very much more economical to operate than the Viscount when traffic loads are light. It also has a useful freight capacity when quickly converted to passenger/freight form, with fewer passenger seats and the bulkhead moved back.

The present Aer Lingus fleet consists of 10 DC-3s, four Viscount 707s, four Viscount 808s (with two more to come) and three F-27s (with four more to come). As deliveries of the F-27 are completed and the remaining two of the additional batch of three 808s are being delivered, the 707s will finally be taken out of service and the DC-3s out of scheduled passenger service. The 707s are, in fact, being taken off the routes as they reach their Check 4s, when they are also, in preparation for sale, being modified to the current standards by Marshalls of Cambridge; it is expected that they will be disposed of, complete with engines and other spares, as a packaged deal. About five of the DC-3s are also being sold and the remainder kept for freight and charter work.

Apart from larger capacity, the replacement of the 707s by 808s gives Aer Lingus the advantage of a standardized fleet powerplant; the only essential variation between the Dart 510s in the 808s and the Dart 511s in the F-27s is that the 511s have different reduction-gears and propellers.

There is one minor tragedy in the disposal of the 707s; they are fitted with mini-Gee equipment and this has apparently been well-liked by the crews, and has been providing fixes in less than 10 seconds. All the DC-3s have an earlier version of Gee and it is a little sad to see the end, so far as Aer Lingus is concerned, of an earlier era in the battle between area-coverage and point-source navigation aids.

Standardization in the fleet has also been applied to these aids and to instrument systems. All the 808s have, for instance, the Collins flight system—the first of the earlier series of three aircraft being, in fact, modified after delivery. The F-27s also have this system, as well as an automatic pilot from the same source. The Collins flight system is shortly to be installed in the two Link trainers at Dublin's Collinstown airport.

Like many other short-medium-haul operators Aer Lingus is now pondering on the kind and class of aircraft which will, during the next five years or so, start to replace the Viscount. Just as study groups were formed to consider the DC-3 replacement problem and the type of aircraft which should be bought for the projected North Atlantic services of Aerlinte, so a study group is probably even now considering this very difficult and vitally important decision.

The thought at present seems to be that, at least for the medium-haul operations, a turbojet, and probably a turbofanjet, aircraft will be necessary to meet competition, if for no other reason. In that case an aircraft of a size and performance of the projected Bristol 205 may be the answer.

Progress in the post-war years can be seen from this table. The jump in freight and mail loads for 1951/52 was partly the result of the decision that all first-class mail should be flown between the U.K. and Ireland.

Financial Year	Passengers	Cargo and Mail (tons)
1945/46	21,630	27
1946/47	76,304	295
1947/48	152,532	869
1948/49	167,349	1,291
1949/50	199,023	2,435
1950/51	221,542	3,082
1951/52	269,220	5,177
1952/53	289,180	5,417
1953/54	300,859	6,689
1954/55	342,745	7,755
1955/56	402,225	8,485
1956/57	457,609	7,776
1957/58	441,363	8,334

The Second Generation Takes Off

VICKERS' new turboprop transport aeroplane, the Rolls-Royce Tyne-powered Vanguard, made a successful first flight on January 20. The two-man crew—G. R. (Jock) Bryce, chief test pilot, and deputy chief test pilot Brian Trubshaw—took off from Weybridge at 15.54 hrs. and landed 18 minutes later at Wisley.

The maiden flight had been planned for the end of December, but a last-minute delay due to an engine defect (THE AEROPLANE, January 16) prevented this. Weather conditions on January 20 were far from ideal: rain storms at first and then a high cross-wind at Wisley held up the proceedings until mid-afternoon.

At a take-off weight of about 95,000 lb., the first Vanguard (G-AOYW) taxied out through deep pools of rainwater and took off in less than 1,800 ft. of runway. After a low pass over the Weybridge works for the benefit of employees and other onlookers, Jock Bryce headed for nearby Wisley—the flight-test centre of Vickers-Armstrongs (Aircraft), Ltd.—whence all test flying will be undertaken.

A fly-past at Wisley was followed by landing. The de Havilland propellers were put into the β-pitch range to apply braking in short bursts and quickly brought the Vanguard to a halt in front of assembled V.I.P.s from B.E.A., T.C.A. and Vickers—many of whom had driven quickly from Weybridge after witnessing the take-off.

During the first flight, which was really also a ferrying operation from the small airfield at Weybridge, the undercarriage was not retracted because it was not intended to be airborne for very long. By the time this appears, the flight-testing programme proper will probably have started from Wisley.

The Vanguard (which was fully described with a cutaway drawing in our issue for December 19) is on order by British European Airways and Trans-Canada Airlines, each of whom so far has a requirement for 20 of the type.

Most unusual aspect of the design is the "double-bubble" fuselage cross-section of which the underfloor lower "bubble" provides two large freight holds. This feature endows the Vanguard with great versatility in giving it the ability to carry an all-freight payload without removing passenger seats.

Maximum take-off weight is 141,000 lb. with a payload of 29,000 lb. These figures are for the Vickers Type 953 for B.E.A., powered by four Tyne R.Ty.11 engines each of 5,525 e.h.p. Recommended continuous cruising speed is 367 knots at 20,000 ft. and at a weight of 121,000 lb. in ISA conditions. The still-air no-reserves range with 5,100 Imp. gal. of fuel is 3,300 nautical miles with a 19,100-lb. payload at 350 knots (mean) at a mean height of 30,000 ft.

The first Vanguards, the Vickers Type 951, are fitted with Tyne R.Ty.1 engines of 4,985 e.h.p., and B.E.A. will use these initially, the gross weight of this type being 135,000 lb. with a payload of 21,000 lb. The Type 952 for T.C.A. will have the Tyne R.Ty.11 and will have the 141,000-lb. gross weight of the Type 953 for B.E.A., but will have a 24,000-lb. payload to suit their longer stage-lengths.

Now that the Vanguard is embarking on its flying programme, Vickers can expect further interest from potential customers. To this end, Sir George Edwards is leaving on a tour of North America at the end of this month. In fact, this was planned some time ago, but the successful first flight will provide useful sales ammunition for the promotion of a most important new British aeroplane. The Vanguard follows the successful series of Vickers Viscounts, more than 400 of which have been sold.

On the Vanguard's first flight Mr. G. R. (Jock) Bryce, left, and Mr. Brian Trubshaw were respectively the pilot and co-pilot.

Operational Versatility —The Vickers Vanguard

Seen making its first flight on January 20, the Vickers Vanguard—the World's first example of a second-generation turboprop airliner—powered by four Rolls-Royce Tynes, has as its outstanding feature large underfloor cargo capacity. This allows full freight payload to be carried without removing passenger seats.

Large photographs copyright "The Aeroplane"

VANGUARD
VICKERS VANGUARD

An Italian Light Transport

ALTHOUGH Piaggio's P.166 light transport aircraft is a landplane, at first sight it might easily be taken for a flying-boat—so similar is the fuselage form to that of the hull of its predecessor the P.136 amphibian (see THE AEROPLANE for April 4, 1958). This later aircraft has, however, been developed primarily as a 6/8-seater business and executive transport. For this rôle it has obviously been thought that the advantages to be gained from the additional facility for water alighting would not compensate for the extra weight involved in making the fuselage underside capable of withstanding water impact loads. Recently the P.166 was sent to America for C.A.A. certification.

Powered by two 340-b.h.p. Lycoming 650-480-BIC6 air-cooled engines, the P.166, like its forebear, has a gull wing with the main wing roots at the mid position on the fuselage. Similarly, the two powerplants—which are six-cylinder, horizontally-opposed supercharged units—are mounted over the top surface of the wing at the "elbow"; they drive three-bladed Piaggio or Hartzell pusher propellers.

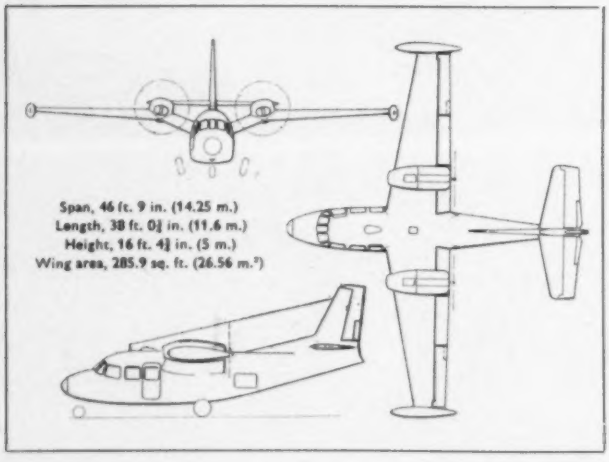
In the main cabin a variety of seating arrangements can be offered to suit the operator. The standard version for executive use has four seats with the two forward ones facing aft or forward as required. The cabin width is, however, sufficient for three-abreast seating and this gives an easy six-seater. There is room for two more seats in the space normally occupied at the rear of the cabin by the toilet and galley. Piaggio's layout plans show an eight-seater with these two rearmost seats facing across the aircraft.

This somewhat unconventional sideways seating is also suggested for other versions. For example a 9/10-seater for shuttle-service operation could have three of its main cabin seats arranged facing inwards along the starboard side.

Although the "flight deck" has two seats and full dual controls, the aircraft can, of course, be flown quite easily with only one pilot—leaving the other seat free for a passenger.

Structurally the P.166 follows the general principles adopted for the P.136. The wing, for example, has two spars—the front main unit taking all the bending stresses while the rear secondary spar closes the wing torsion box and carries the slotted ailerons and flaps. Flush riveting for the skin is used throughout.

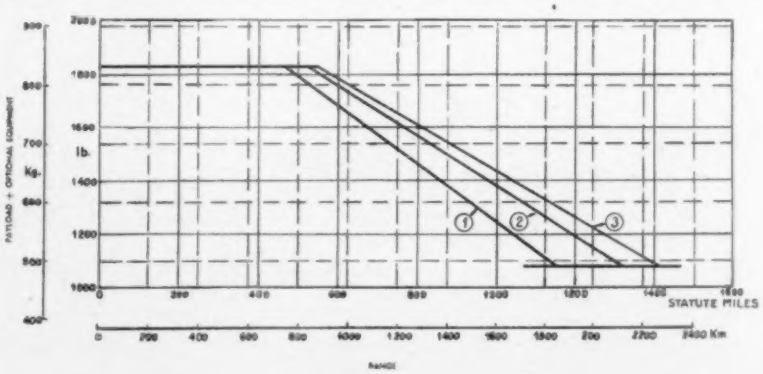
The fuselage is a semi-monocoque structure and as in the case of the wing, flush riveting is employed for the skin attachment. The tailplane is a cantilever unit similar in construction to the wing.



Technical Data

WEIGHTS AND LOADINGS.—Empty (standard equipment), 5,004 lb. (2,270 kg.); useful load, 2,712 lb. (1,230 kg.); payload (six-seater), passengers 850 lb. (385 kg.), luggage 110 lb. (50 kg.); fuel, 1,166 lb. (529 kg.); oil, 66 lb. (30 kg.); max. gross, 7,716 lb. (3,500 kg.); wing loading, 27 lb./sq. ft. (131.8 kg./m.²); take-off power loading, 11.3 lb./b.h.p. (5.1 kg./cv.).

PERFORMANCE.—(From certification flight tests) Max. speed at S.L., 203 m.p.h. (327 km.p.h.); cruising speed at 65% METO power and 13,400 ft. (4,100 m.), 202 m.p.h. (325 km.p.h.); stalling speed, flaps and undercarriage down, 68 m.p.h. (109 km.p.h.), flaps and undercarriage up, 78 m.p.h. (126 km.p.h.); max. rate of climb, 1,305 ft./min. (6.6 m./sec.); service ceiling, 27,500 ft. (8,380 m.); take-off over 50 ft. (15 m.) at S.L., 1,550 ft. (472 m.); landing from 50 ft., 1,240 ft. (380 m.); range (six-seater), 1,155 miles (1,855 km.).



Range/payload performance for the Piaggio P.166. The curves marked 1, 2 and 3 are respectively for 70% METO power at 12,000 ft. average altitude; 60% at 13,500 ft. and 50% at 15,000 ft. Range figures are based on a fuel reserve supply for ½ hr. at 50% METO power.

The Fighting Services

Fifth Sea Lord Appointment

VICE-ADMIRAL L. G. DURLACHER, C.B., O.B.E., D.S.C., is to become a Lord Commissioner of the Admiralty, Deputy Chief of Naval Staff and Fifth Sea Lord, in succession to Vice-Admiral Sir Manley L. Power, K.C.B., C.B.E., D.S.O., with effect from next month.

Deputy Director of the Signal Division at the Admiralty between 1945 and 1948, Vice-Admiral Durlacher commanded the 3rd Destroyer Flotilla until 1950 when he became Captain Superintendent of H.M.S. "Mercury II," the Admiralty Signal and Radar Establishment at Portsdown. He was appointed Chief of Staff to the Commander-in-Chief, Far East, in October, 1952, and two years later became Deputy Chief of Naval Personnel (Personnel Services) at the Admiralty.

He was Flag Officer Commanding the 5th Cruiser Squadron and Second-in-Command, Far East Station, from August, 1957, until December, 1958. Promoted to the rank of Rear Admiral in 1955, he became Vice-Admiral in July of last year.

As recorded on this page, Vice-Admiral L. G. Durlacher, C.B., O.B.E., D.S.C. is to take up the appointment of Fifth Sea Lord next month. The post is at present held by Vice-Admiral Sir Manley L. Power, K.C.B., C.B.E., D.S.O.

Cadet Warrant Officers

BETWEEN 700 and 800 cadets of the Air Training Corps who are approaching their age limit of 18 are to be allowed to stay with the Corps for another four years, providing they can qualify for a newly introduced rank of Cadet Warrant Officer. The purpose of the new rank is to enable squadrons to retain cadets so that they may serve as A.T.C. adult Warrant Officers or as A.T.C. officers commissioned into the Training Branch of the R.A.F.V.R.

Cadet W.O. vacancies will not, however, be filled automatically, and cadets nearing 18 will be carefully selected for promotion. They will wear the uniform worn by the A.T.C. Warrant Officer, except that a cloth badge of rank consisting of the A.T.C. Falcon encircled by a laurel wreath in light blue on a dark background will be worn on the lower sleeve of both arms.

Boyd Trophy Award

PRESENTED annually for the finest feat of aviation of the year in the Royal Navy, and the premier prize of the Fleet Air Arm, the Boyd Trophy has been awarded for 1958 to No. 845 Squadron. This is for the part played by the Squadron's helicopters in the successful salvage of the Liberian tanker "Melika" by the carrier "Bulwark," in which the Squadron was embarked at the time, and for its operations in circumstances of outstanding difficulty.

Amongst the many tasks performed by the Squadron's helicopters during the "Melika" operation were flights to take medical officers to other tankers who had picked up injured survivors, some of whom were flown back to "Bulwark" for treatment. Nine of the most seriously injured were then taken to R.A.F. Masira. The three helicopters carrying out this task all had to make night landings. After considerable difficulty had been experienced in passing and maintaining the tow and it had parted because of the violent yawing of the "Melika," a fresh tow was secured by using a helicopter to pass the first line.

During operations in the Aden Protectorate No. 845 Squadron's helicopters operated over mountainous terrain to heights of 8,000 ft. in a temperature of more than 100° F. The Squadron is at present at R.N.A.S. Culdrose and will shortly embark in H.M.S. "Centaur."

P.A.F. COLLEGE GRADUATION.—The President of Pakistan, Gen. Mohammad Ayub Khan, presenting the Atcherley Flying Trophy to Cdt. U/O Razzaq at the recent graduation parade at the Pakistan Air Force College, Risalpur. Air Marshal Sir Richard Atcherley, who was C.-in-C. of the P.A.F. between 1949 and 1951, was guest of honour at the ceremony.

R.A.F. Appointments

THE following are among recent Royal Air Force appointments:—

Wing Commanders: C. K. Street, M.B.E., to Air Ministry for duty in the Department of the C.A.S. (with acting rank of Gp. Capt.); P. J. Anson, D.F.C., to R.A.F. Chivenor as Chief Instructor and Officer Commanding the Flying Wing; P. R. ap Ellis to R.A.F. Hawarden as Regional Recruiting Officer; E. P. Appleton to the R.A.F. Records Office to command "A" Division; E. J. Brooks, D.F.C., to R.A.F. Wethersfield as Officer Commanding and R.A.F. Liaison Officer; J. McD. Craig, D.F.C., to the R.A.F. Flying College, Manby, as Officer Commanding operational studies; P.G. D. Farr, O.B.E., D.F.C., to the Joint Services Staff College for Directing Staff duties; P. W. Helmore, D.F.C., A.F.C., to Air Headquarters, Malta, for air staff duties; L. C. Inglefield to the R.A.F. Regiment Depot, Catterick, as Chief Instructor; R. R. Jack to Headquarters, R.A.F. Germany (2nd T.A.F.) for administrative staff duties; A. J. Moody to R.A.F. Germany (2nd T.A.F.) for duty in the Commander-in-Chief's Secretariat; T. F. Neil, D.F.C., A.F.C., as secretary, British Joint Services Mission, Washington; T. C. Pinkerton, A.F.C., to R.A.F. Hemswell to Command the Technical Wing; G. F. Rogers, O.B.E., to No. 1 School of Technical Training, Halton, for accounts duties; A. Shaw, D.F.C., to Air Ministry for duty in the Department of the Chief of the Air Staff; R. J. V. Smyth, D.F.C., to the Australian Ministry of Supply, Melbourne; A. B. Thomas to Air Ministry for duty in the Department of the Air Member for Supply and Organization.

Squadron Leaders: A. E. Harkness, A.F.C., to Headquarters, Fighter Command, as Deputy Senior Personnel Staff Officer (with acting rank of Wg. Cdr.); A. J. H. Kitley to R.A.F. North Front, Gibraltar, to command the Administrative Wing (with acting rank of Wg. Cdr.); K. R. Manns to Headquarters, Technical Training Command, for administrative staff duties (with acting rank of Wg. Cdr.); D. R. Locke, O.B.E., to the R.A.F. Staff College, Bracknell, for planning duties (with acting rank of Wg. Cdr.); J. A. Theophilus, O.B.E., to the R.A.F. College, Cranwell, as Deputy President, Selection Board (with acting rank of Wg. Cdr.); D. Q. Watson, D.F.C., to R.A.F. Staff College, Bracknell, for directing staff duties (with acting rank of Wg. Cdr.).

Squadron Officer S. Harding, W.R.A.F., to Headquarters Flying Training Command, for administrative staff duties (with acting rank of Wg. Off.).

Reunion

No. 38 Group.—The 13th annual reunion dinner and annual general meeting of No. 38 Group Old Comrades Association will be held at the Victoria Hotel, Buckingham Palace Road, London, S.W.1, on March 7. Tickets, price £1 each, can be obtained from Mrs. L. C. Rendall, Hotel Metropole, Brighton, Sussex.

Army Air Transport
—*One Soldier's View*

By Major Brian Haimes, R.A.S.C./A.E.R.

NOT so long ago the Editor of THE AEROPLANE wrote:—"Looking back to the early 'thirties, there is a lesson to be learnt from the fact that complete gold mining dredging equipment was flown into the hinterland of New Guinea in Junkers Ju 52 monoplanes. Today it should not be difficult for the Army to call in a few mining engineers and learn from them something about ways and means of sectionalizing equipment for transport by air."

That made me bristle. And not only because of that dreadful word "sectionalizing." The British Army, dear reader, has nothing to learn from anybody on the subject of loading, handling, cutting-up or parachuting military equipment. It is a fashionable thing, I know, to regard the Army officer as something of a clot—the perennial public schoolboy who wasn't quite clever enough to get into the Civil Service. But so far as the air side of the Army is concerned, this is somewhat less than accurate. Even in the bad old days of the Burma sideshow, 15 years ago, we thought we knew something about shifting air freight, either whole or sectionalized.

I haven't time or space to go into it in detail, but if you want to know about it look up the official reports about the air supply of the 7th Indian Division in the Battle of the Box, Arakan, 1944; or the airlift of the 5th Indian Division from the Arakan to Imphal later that year; or the air maintenance of the two Wingate operations; or the freight line to Meiktila, March, 1945. This is not to mention the routine air maintenance of a force of 600,000, nor the European operations—Normandy, Arnhem and the Rhine crossing. I think the record shows that the Army knew then, and knows now, a little about how to travel by air.

In fact, it knew a great deal more than it ever had a chance to practise, hog-tied as it was by having to make use of left-over, made-over, pseudo-transports which were the best that could be found for it. Have you, for instance, ever shipped jeeps by C-47? You grind unsteadily up a couple of wobbly ramps, nearly at right-angles to the fuselage, in low gear, fast enough not to roll backwards but not so fast that you charge across the fuselage and go through the opposite wall. Having got in just so far, you manhandle the thing round and then shunt it up forward and lash it down.

If you're good you can do it in 10 minutes, but it ought to be possible to do it in two by driving straight in. Of course, it was easier in C-46s because the doors were bigger, but come the day when you had to move 15-cwt. trucks, somehow there were never any C-46s available. Still, a 15-cwt. truck could be loaded and flown in a C-47 and so could a 3-tonner if you stripped it down and cut the chassis in two across the middle, and were prepared to reweld it in the forward areas.

Consider also the barrel of a 5.5-in. gun. I cannot remember what it weighs, but it's quite a lot; say, half a ton. It is also about the length of a C-47 fuselage and exceedingly difficult to thread in through the side door and up the fuselage. It wouldn't be much good trying to sectionalize it, and the gunners wouldn't thank you for trying. In 1959 substitute "missile" and "Comet," or "rocket" and "Shackleton."

These examples could be multiplied a thousandfold, but would probably be taken for the backward-looking maunderings of an old fogey. Thirty-six next birthday, actually. A mere lad. The point, however, is simply to underline the fact that the Army has been doing this sort of thing for a year or two, but more particularly to point out that today, as always in the past, it has to make do with whatever adapted aircraft the Air Force may be able to spare, which will not in any case have been designed for the job.

A falling jeep seen from the freight hold of a Beverley during trials in Malaya. The static line has not yet begun to deploy the first parachute.

The Army air transport side of the Suez operation of Autumn, 1956, was mounted with Hastings, you may remember, carrying jeeps and small guns on external racks for parachuting. If an airfield had ever been taken, in the classic form of airborne operations, the same aircraft would then have reverted to air freighting, for which they would have been only about 10 years behind the times. The Beverleys could have supported them in this, assuming that there were enough, and that they were all serviceable. But the Beverley is somewhat slow. It is also unarmed, and there would be little point in arming it. It would have to have escort or else take the risk of being shot down by dull, old-fashioned, conventional weapons like machine-guns or Bofors guns or 88-mm. artillery.

It is quite surprising how dead you can become when hit by one of those, and even if crews are expendable there is no particular point in mounting a freight operation if the bulk of the freight is not going to reach its destination. The most subtle sectionalizing and handling skills become somewhat barren in those circumstances, as the Germans discovered in Tunisia in 1943, when they tried to maintain their garrison by air with Ju 52s against Spitfire opposition.

No, the fact of the matter is that the British Army has not yet had, and shows few signs of getting, the types of transports and freighters which it requires. I have deliberately used

Left, manhandling a 25-pdr. gun into a Dakota in India, and below, persuading a jeep into a Dakota.

A jeep and 6-pdr. gun loaded in a Halifax bomb bay.

plurals there because there are several quite distinct functions to be carried out in keeping an army supplied by air.

So long as you wish merely to carry men or materials about between base areas, or between the base and the war zone, your airline transport can usually do the job, and it does not even have to be pressed into formal military service, as was demonstrated in the Korean War. There is often also a straightforward transport function for men and freight to be carried out inside a war zone, but when you have to deliver equipment to a forward airfield right up at the sharp end, where the shooting is going on, you must have an aircraft which will take its load straight in through a hole at the back or front and deliver it right out again the same way.

The reason for this is that you really cannot spare the time, either at base airfields or in the forward areas, to break equipment down for air freighting and then to reassemble it where it is needed. It must travel in one piece. This is why gliders were used during World War II, both on initial landings (France 1940, Crete and the Wingate "ops" and Sicily) and to back up lightly equipped parachute troops.

There is another point, exemplified by the Arnhem failure, namely, that if you have not enough aircraft, good, bad or indifferent, to put in your full complement of men and/or equipment in one lift, then you may as well give up. Unless your operation is unopposed, that is, but I am talking about war, not party games, and to assume an unopposed landing is unrealistic.

The delivery of the 1st Airborne Division at Arnhem was made in three separate lifts, and the consequent delay in mustering an effective fighting force was a major contributing factor to the defeat. Furthermore, the supporting vehicles, bulldozers, artillery (and rations), never arrived, mainly because the weather turned bad. But if they had all been in the first lift the bad weather would not have mattered nearly so much.

Without its heavy equipment an airborne division cannot survive. It is not designed to survive, in fact, since it is very lightly equipped on the assumption that the heavy equipment will be available within a short time after the first landing. This can be achieved by parachuting it with the troops—if you have the right aircraft. Or, given a little engineering material, and some breathing space, any force of brigade size or larger can hack out some sort of airfield capable of receiving combat freighters which can land and disgorge their load before getting out again quickly. If you must land, the emphasis is on a quick turnround, not only because it is economical in aircraft, but also because no enemy is going to let fat transports sit around unharmed.

Of course, it may not be necessary to land. If you can parachute equipment on a large scale you save yourself a lot of trouble, and not a great deal of payload is lost in providing parachutes and packing gear. But the loads have to be big and they must be dumped in one piece on one spot. It is not the slightest use putting your guns, vehicles and heavy stores out in penny packets to be reassembled on the ground.

It was necessary in Burma, where the only aircraft available were Dakotas and the dropping zones were usually small affairs serving relatively small formations, but it could only be done at the cost of making, perhaps, 20 circuits to drop a load of 6,000 lb., of which approximately 30% consisted of packing material. This type of operation was only possible because there was no flak and seldom any fighters. When fighters did appear amongst the slow, unarmed, loaded transports the result was more than somewhat murderous. It will not work in any theatre where there is opposition.

Leaving aside the business of being shot at, which is an accepted military risk, the technique was not good enough in World War II, and it will not be good enough in future. One small concrete example will illustrate.

In 1946-47 the 2nd Indian Airborne Division was the internal security force for the Indian sub-continent, responsible for maintaining order during civil disturbances and for acting as a mobile strategic reserve. As an airborne division it was lightly equipped and relied on a supporting drop of artillery to give it hitting power above and beyond the ordinary infantry battalion weapons. So long as a Halifax squadron was available to drop 75-mm. howitzers in one piece the division was sure of having artillery available within three minutes of reaching the ground, most of that time being occupied in assembling the gun crews round the guns, breaking down the packing crates and assembling the guns.

When the Halifaxes were taken away their job had to be taken over by Dakotas. Now, the 75-mm. pack howitzer was designed to break down into nine parts for carriage on mules in mountain warfare. In consequence, the guns were fairly adaptable for dropping from the para-racks and doorway of a Dakota, but only at the cost of an improvised lash-up in the best Fred Karno tradition. I know; I designed it.

The crew and ammunition had necessarily to drop from the same aircraft, and with the best will in the world it was virtually impossible to drop gun and crew in a pattern less than a thousand yards long. If the crew were at all slow in getting out (and they could not start until the gun was clear), then the last man might well be several miles away from the first part of the gun. As all gun crews work as a highly integrated team, the whole operation was apt to grind more or less to a halt while Gunners Bloggs and Jenkins came puffing up from over the hill to do their share.

Even so, we managed to get the time down to 12 minutes

Speeding things up. Guns and trailer, on pallets for dropping by parachute, mounted for transport to air base.

from start of drop to first shell in the air. This is very good, but not good enough, and the delay was quite unnecessary. It resulted simply from having to do the job in an inefficient manner through not having the right machine to handle it.

As a first step it might be as well to be specific about the various tasks I have mentioned. I doubt if atomic warfare will alter the situation very much. If the third world war lasts only a few hours there will be a considerable demand for any air transport which remains, only the object will be to clear up the mess rather than to contribute to it.

Otherwise the Army, in common with the other Services, has a need for long-range air transport of passengers and freight between its secure bases and the war areas. This might reasonably be called strategic transport and can be met largely by the types of aircraft in use on major airlines, since the job is the same and no special extra qualities are required. The United States trans-Pacific transport line during the Korean War was a good example. At the same time, the better such aircraft get, the more they need first-class airfields and are therefore normally debarred from operation from the inconvenient places in which wars tend to be fought.

At this level there is a steady demand for tactical transport, ferrying men and materials from base areas to forward areas. If there are airfields up forward, men and supplies will be landed, since this is faster and more economical than parachuting them, but a fairly robust aircraft is needed since the airfields will be pretty rough. Speed would be nice since it would produce more loads per day, but it is not a vital requirement. If airfields don't exist, the supplies must be parachuted, preferably in large lumps rather than penny packets, and possibly into rough, mountain country. This calls for manœuvrability and, since we can never expect specialized aircraft for each rôle, the requirement is for a tail-loader or, maybe, a pod-dropper—the pod to be any size up to a complete fuselage.

At the same time troops may have to be transported to forward airfields in large numbers over long periods, or they may have to be parachuted in large numbers, presumably for short periods, followed by a re-supply operation. Clearly, the same aircraft are going to have to fulfil this function.

This is acceptable since the compromises required do not much reduce the value of the aircraft in any individual rôle. On the other hand, if you try to make the same aeroplane do both a tactical and a strategic job you end up with one that does neither properly.

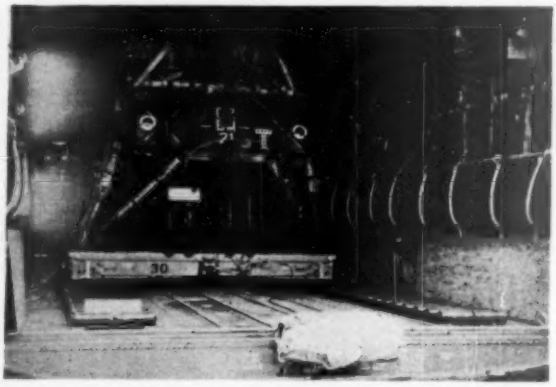
Question: What are the right machines for tactical transport? Well, the Beverley is a compromise in the right direction. That this should be so is probably not unconnected with the fact that the chairman of Blackburns served on the Army side of the air-freighting operations in Burma during World War II. It is a fine big-load carrier and is much less unwieldy than it might seem. It performs extremely well in and out of short fields as a freighter, and for parachuting operations it has an immense capacity for putting down large amounts of men and equipment as coherent fighting units in one place.

I am personally dubious about its ability to get right down low and place its load on pocket-handkerchief dropping zones in bad country, but I have not had the opportunity to see it in action under those conditions, so it would be unfair to criticize. I would also be unhappy to fly on operations in so big, so obvious and so slow a target, but perhaps this is irrelevant. An aircraft which does seem to have the right qualities for short-range, tactical support of troops is the Fairchild Boxcar.

Both aircraft can be fitted with roller runways on the fuselage floor, as required, and any reasonable military load can be got out in one or two pieces at most if they are preloaded on Brooks and Perkins loading platforms. Doing this necessarily takes a goodly number of man-hours per load at the base airfield, but it pays dividends in fast and accurate delivery out of the aircraft and on to the dropping zone.

A thing which distresses me about the British approach to modernized freighting is that, having got some large and expensive aircraft and some very expensive loading platforms, and having delivered each aircraft load to its aircraft on its own truck, we then use the sweat and strain of about 20 men to get the load off the standard Army truck into the aircraft via a jack-operated R.A.F. trolley. Meanwhile, various officers and men anxiously line everything up to ensure that the load goes straight on to the roller runway and does not shift its weight too suddenly from truck to aircraft.

How nice if we could adopt the system used with the Lockheed C-130, whereby there is also a roller runway on the truck and the load is winched into the aircraft by the truck driver with automatic compensation for the rise of the truck and the sink of the aircraft as the load shifts from one to the other. By this method four men can load 90,000 lb. of "palletized" load in 10 minutes. A similar method is used to extract the load on the ground, but it seems questionable whether such sophisticated vehicles would ever be available to British troops at forward airfields.

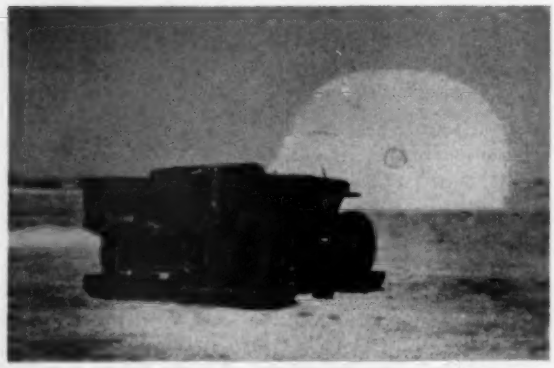


Truck and trailer in a C-119 on a Brooks and Perkins platform.

However, there does not seem any good reason why most military loads should not be whipped smartly out of a moving aircraft on to the ground, during the landing run, by using only an extractor parachute. The drop would be small and the run in and out could virtually be treated as a baulked landing. I have not so far heard of anyone trying this, but it seems perfectly feasible and only an alternative to the dropped fuselage, which Fairchild have already worked on.

Without going any more into the pros and cons of the many aspects of military air-freight operations, let me just say that there are one or two of us thinking about these problems. We hope we are not being too medieval and Blimpish about them, but if the approach and the methods sometimes seem rather antiquated the reasons may be the need for compromise, and plain shortage of Treasury allocations of cash, rather than simple witlessness.

P.S. It will be clear that this was written before the recent Ministry of Defence announcement regarding the forthcoming R.A.F. order for the A.W.A.650. Life is like that.



Five seconds after impact, the parachutes are released and within two minutes the jeep will be ready to drive away.

EMPHASIS ON MOBILITY

Nowadays changes in strategical concept, the type of defence required, and the very nature and direction of any hostile threat, occur with bewildering rapidity. Deployments undertaken at enormous cost are found to be no longer required. Defences need re-siting. The exact location of static sites becomes common-knowledge. Formations and units in the field need defending.

TO ALL THESE PROBLEMS, THE ANSWER IS

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Underwater Ejection Developments

IT is proposed that all Fleet Air Arm aircrew will be instructed in the use of ejector seats for escape from ditched aircraft during their operational training on a similar basis to the live ejections at present made with the aid of the Martin-Baker training rig. A test tank for the submerged escape training is being built near Fareham.

One successful escape by the use of the ejection seat was made by Lieut. B. MacFarlane, R.N., from a submerged Wyvern in October, 1954, and in 1957 trials into the problems of such procedures were started by the R.A.F. Institute of Aviation Medicine. The investigating team consisted of three Naval medical officers assisted by clearance divers from H.M.S. "Vernon." One result of their work has been the production of a training film for instructing aircrew in the correct drill for such emergencies.

For the trials a standard Martin-Baker Mk. 2D ejection seat was used and only one modification—to the firing head—was necessary to make it reliable under water. The main physical problems of underwater ejection are the acceleration of the body through the water; the drag of the water on the body; the blast pressure from the explosion of the ejection-seat charge, and the possibility of a burst lung as a result of the change in pressure with changing depth. At first the blast pressure caused some concern, but this was later found to be a good thing. It struck the pilot in the chest and stomach with a force which made him gasp and begin exhaling air. He thus reduced the danger of a rupture in his lung as he rose in the water.

The initial trials were undertaken with a life-size dummy and two seat-guns were used. One, with a velocity of 60 ft./sec. through air, propelled the seat and dummy through the water at approximately 26 ft./sec. The other was a 80-ft./sec. system which gave a propulsion rate of approximately 34 ft./sec. The maximum peak acceleration force did not exceed 9*g* with the mean acceleration being less than 6*g*.

The vertical distance travelled by the seat and dummy averaged 14 ft. to 17 ft., representing a change of hydrostatic pressure of half an atmosphere—equivalent of a relative change in pressure from sea level to 18,000 ft.

First of the live underwater ejection trials were made in a tank at the R.A.E. Farnborough. Experiments were then switched to the tanks of the Admiralty Hydro-Ballistic Research Establishment at Glen Fruin, Dumbarton, which offered greater depth and better facilities for ciné recordings. The first ejection here was made from a depth of 25 ft. The powder in the cartridge charge had been reduced for the test, but even so the pressure wave striking the oxygen bottles across the subject's midriff caused considerable discomfort. Oxygen bottles were removed from this position for the subsequent trials. This series of experiments increased the powder charge in the seat-gun up to the full standard charge used in air ejections.

Trials also included ejection escapes from a Seahawk cockpit 40 ft. under water. The main problem of jettisoning the canopy under water is that there is no airflow to carry it away. Instead, the weight of water holds it down on top of the cockpit and 50 sec. was required to equalize the pressures and release it.

Aslib Aero Group

ONE aspect of the aeronautical industry that does not get its share of publicity is librarianship, but there is no closer-knit or more co-operative body of operatives.

This co-operation is revived every year at the annual conference and general meeting held at Cranfield, somewhere round Easter. This year it is during the weekend, April 3-5.

Papers will be read by J. E. Allen and by R. A. Wall, both of A. V. Roe and Co. Under the general heading, "The Place of the Library in a Guided Missile Organization," the first part is "The Technical Environment" and the second "The W.R.D. Library and Information Service." R. C. Wright and R. A. Fairthorne of the R.A.E. will review their experiences at the Washington Conference on information dissemination.

The conference will also discuss a paper which it is proposed to submit to a competent authority reviewing the present position and the future prospects of aeronautical librarianship in relation to trends in the industry.

Non-members of the Group are welcome—be they librarians or not—and further particulars may be obtained from T. M. Aitchison, divisional librarian, English Electric Co., Ltd., The Airport, Luton. Early application is advised.

Helicopter in Snowdonia

WESTLAND AIRCRAFT, LTD., recently provided a Widgeon five-seat helicopter to transport men and equipment to a snow-isolated experimental radar station 2,500 ft. up on the peak of Drum, 10 miles north of Snowdon.

Following the recent freeze-up the road to the station became impassable, and Metropolitan-Vickers, who operate the station, requested a helicopter to fly personnel and stores from the village of Aber so that the work of the station could continue.

On January 13 Mr. John Fay, Westland's chief flying instructor and test pilot, along with Mr. Stan Rapley as service engineer, flew from Yeovil to Llanbedr. Operations began the next day, the Widgeon flying from Aber and using Llanbedr as an overnight base, and lasted until January 16.

On the first day five flights were made to and from Drum; there were three on the second and one on the final day. The Widgeon carried three radar engineers and more than a ton of stores, including snowshoes, batteries, first-aid and specialized equipment, diesel oil and food. All supplies were carried in the passenger cabin, requiring the removal of the four passenger seats (which takes a couple of minutes) to transport a 3-ft. square box.

John Fay reports that the operations were entirely successful, although the temperature on the mountain was 2°C., and quite uneventful.

Westland's Widgeon, G-ANLW, which Mr. John Fay flew on supply work in Snowdonia.

News About People

(*Continued from page 118*)

SAFETY APPOINTMENT. — Mr. A. M. A. Majendie has accepted the invitation of the Minister of Transport to join the Air Safety Board, which was set up in 1946 to consider problems affecting the safety of air transport. Mr. Majendie, a director of Smiths Aircraft Instruments, was previously a council member of the A.R.B. and, as Flight Captain of B.O.A.C.'s Comet Fleet, commanded the World's first scheduled turbo-jet passenger service in 1952. The new composition of the A.S.B. is: Air Marshal Sir Charles Guest (chairman), Lord Brabazon, Sir Arnold Hall, Sir William Farren, Mr. A. G. Elliott and Mr. A. M. A. Majendie.

POWER JETS ENGINEER. — Mr. N. M. Clark, B.Sc.(Eng.), A.C.G.I., A.M.I.Mech.E., has been appointed chief engineer of Power Jets (Research and Development), Ltd., in succession to Mr. J. Hodge, who joins the Holman Group.

G.E.C. POST.—The General Electric Co., Ltd., announces that Air Cdr. C. E. Bell has joined its electronics division. He was formerly Director of Electronics Research and Development (Air), M.o.S., and before joining the Ministry in 1954 held several R.A.F. appointments in that field.

I.A.S. AWARDS. — Scheduled to receive awards from the Institute of the Aeronautical Sciences in New York on January 27 were Sir George Edwards, managing director, Vickers-Armstrongs (Aircraft), Ltd., and Dr. Charles S. Draper, head of the Department of Aeronautics and Astronautics, M.I.T., who are made honorary fellows. Dr. A. M. Ballantyne (R.Ae.S.) is named as a Fellow.

WINNERS AT BROUGH.—At the 28th annual prize-giving of Blackburn and General Aircraft's Brough apprentices the principal awards were presented to, left to right, (back row) J. M. Chaney and P. L. Snowden and (front row) P. Suddaby, M. L. Jennings and B. Maskew.

D.H. INDUSTRIAL SALES.—Mr. J. B. Waite has been appointed industrial sales manager of de Havilland Propellers, Ltd., as from January 1, remaining directly responsible to Mr. C. R. Burgess, the sales director. This appointment indicates the company's policy of extending its range of products to include commercial equipment applicable to markets outside the aviation industry.

ROLLS - ROYCE CHANGE.—Mr. J. F. Harriman, M.B.E., M.Sc. (Eng.), informs us that he has left Rolls-Royce, Ltd., where he was in charge of mechanical development at the Flight Development Establishment, Hucknall, and has joined Ericsson Telephones, Ltd., Beeston, Nottingham, as deputy head of the electro-mechanical division of the research laboratories.

AIRWORK CHANGES.—Mr. R. W. Cantello has been appointed managing director of Airwork Services, Ltd., and Dishley Engineering, Ltd. He was previously general manager of the two companies, and this responsibility will now be shared by Mr. J. H. Hopkins (Airwork Services) and Mr. J. S. Reid (Dishley Engineering). Mr. D. F. Burmby is commercial manager of Airwork Services and is based at Airwork's London Office. Airwork Services have left Gatwick and their main base is now at Bournemouth (Hurn) Airport.

MEMORIAL SERVICE.—The first memorial service—to the late Louis Massey Hilton—in St. Clement Danes since its re-dedication as the R.A.F. Church, was due to be held today, January 30. A note on Mr. Massey Hilton was published in THE AEROPLANE of December 5 last.

SPERRY POST. — Mr. Robert Broadbent has been appointed managing director of the Sperry Gyroscope Co., Ltd. Details of the company's reorganization are on page 140.

Military Aviation Affairs

INDONESIAN GANNETS.—Eighteen Gannet anti-submarine aircraft have been ordered by the Indonesian Government, and the contract is due to be signed within six months, according to Mr. Richard Fairey, vice-chairman of Fairey Aviation, who is in Australia. The aircraft are to be delivered over the next three years, and assurance has been given that they are to be used only for police duties.

NORTH AMERICAN RADAR.—The R.C.A.F. is to take over the manning of the operational positions of the Distant Early Warning (DEW) Line stations in the far north of Canada. Most of the U.S.A.F. officers will be replaced progressively as R.C.A.F. officers are trained; nearly all the civilian positions in the DEW-Line are already filled by Canadians.

MILITARY FRIENDSHIPS.—Twelve Fokker F-27 Friendships have been ordered by the R. Neth. A.F. for delivery in 1960 at a cost of about £3 million. They will equip the one transport squadron, No. 334, which at present operates Douglas C-47s.

FRENCH ARMY AVIATION.—The French Army has ordered 150 Nord 3400 two-seat high-wing observation and casualty-evacuation aircraft. A 260-h.p. Potez 4-D 34 engine gives it a cruising speed of 124 m.p.h.

GAN STAGING POST.—Recent talks between a Maldavian Government delegation and the British High Commissioner in Ceylon, over an agreement for establishing an R.A.F. staging post on Gan Island, were adjourned on January 24 without producing any results. An agreement was initiated in 1956, granting the U.K. a lease of Gan Island and 100 acres in Hittadu Island for £2,000 a year for 100 years.

PACIFIC CARRIER.—The U.S.A.F. is to introduce the Douglas C-133A Cargomaster into its regular Pacific cargo service. Following a survey flight, the transport will be operated in the Far East by the MATS 1501st Air Transport Wing at Travis A.F.B.

HERCULES ORDERS.—The Lockheed Aircraft Corpn. has orders for 75 of the C-130B Hercules, the first of which flew recently. The first 36 will go to the U.S. Marine Corps; they are to be fitted as in-flight refuelling tankers but convertible, in 4 hr., for troop-transport work.

DOMINICAN VAMPIRES. — A report from Washington states that the Dominican Republic is buying 12, and possibly more, D.H. Vampires in Canada for air-defence purposes. They are presumably ex-R.C.A.F. aircraft, a number of which were placed on disposal some time ago.

MALAYA ARRIVAL.—After piloting the first R.A.A.F. Hercules to Butterworth from Australia, Wg. Cdr. I. R. Olorenshaw, D.F.C., (C.O., No. 36 Sqn.), left, was greeted by, left to right, Gp. Capt. J. E. S. Dennett (C.O., base squadron, Butterworth), Air Cdre. K. R. J. Parsons, D.S.O., D.F.C., A.F.C., (O.C. R.A.A.F. Butterworth), and Wg. Cdr. J. A. Lombard.

Book Reviews

BRITISH NAVAL AIRCRAFT, 1912-58. By Owen Thetford. 426 pp., 5¼ in. by 8¼ in. Illustrated. Putnam and Co., Ltd. Price 50s.

BY its very nature, naval aviation tends to produce strange-looking aircraft. No designer deserves greater credit—or sympathy—than one who has to obtain reasonable performance from a machine that must operate from a ridiculously small carrier deck, perform half a dozen assorted duties when required and fold itself into a tiny package in a corner of the ship when not required.

A book crammed full of pictures and details of these improbable aeroplanes cannot fail to be of interest. When, as in this case, a high proportion of the photographs are excitingly new and the data are as comprehensive, accurate and readable as one has learnt to expect from Owen Thetford, the result is something to treasure and an indispensable work of reference.

"British Naval Aircraft" is a companion volume to the author's "Aircraft of the Royal Air Force, 1918-58" and follows the same format. In some ways it is the better of the two, for it goes right back to the start of British military flying in 1912, whereas the R.A.F. book covers the period from 1918.

More than 100 main types receive at least two pages each, with a photograph, three-view line drawing, historical narrative and specification, including complete lists of units which flew them and all significant serial numbers of individual aircraft. There is also a 22-page introductory note on the history of British Naval Aviation since 1912, and appendices containing photographs and brief details of 130 less-important types of aeroplane, 17 types of airship operated under naval control between January, 1914, and December, 1919, and notes on the 90 seaplane and aircraft carriers built to embark British naval aircraft.

Clearly this is a book for anyone with the slightest interest in military aviation. Collectors and enthusiasts have good reason to feel grateful that so many rare photographs have been unearthed from the archives of the Air Ministry, Imperial War Museum and private collections.

How many readers will recall the Alcock Scout, devised by Jack Alcock of transatlantic fame, or the Breguet de Chasse flown by the R.N.A.S. in 1912-14? How many will know before they see the pictures in this book that the R.N.A.S. had six of the huge Caproni Ca41 three-engined triplanes, or a Handley Page crescent-wing aircraft in 1913?

Nor is this merely a book of facts and photos. There are countless good stories mixed in with the historical notes, ranging from a potted account of the Taranto raid to Terence Horsley's description of how, on a rough day, the Walrus behaved more like a cow than a bus—a very friendly cow which wallowed in the trough of the rough airs as a heifer knee-deep in a boggy meadow. Such sidelights help to convey something of the joyous spirit of the web-footed flyers who have piloted such a variety of products of our aircraft industry, from the Short S.27 of 1912 to the supersonic Scimitar of today.—J.W.R.T.

WHO'S WHO IN WORLD AVIATION AND ASTRONAUTICS. Volume II, 1958. Managing Editor, Marion E. Grambow. 479 pp. 6 in. by 9¼ in. American Aviation Publications, Inc.

FOR some reason best known to themselves, the publishers are producing this reference work in volumes and not in editions, but it means the same thing. The first difference from the previous (1955) edition is, of course, the addition of the words "and Astronautics," thus showing that the publishers are keeping abreast.

This is not the sort of book one can read right through and then give an opinion. It is a reference book about people and any errors will only come to light with use. In the same way, omissions will materialize when you find that the very person you require has not attained its eminence. It is published in America and one cannot, therefore, expect too much of the British material—for which most of us rely on a certain directory published in this country.

It is not very surprising to find Basil Smallpeice spelt Smallpiece, but it *is* surprising (to this writer, at any rate) to find, in the list of abbreviations, that R.Ae.S. stands for Royal Aeronautical National Society. Perhaps Mr. Parrish could be persuaded to call on the oldest aeronautical society in the World next time he touches London on his tours. Even their own I.A.S. is not given its definite article. However, there are quibbles and for those who need biographical material on a high percentage of the prominent in this aero/space era "Who's Who in World Aviation and Astronautics" must find room on the bookshelf.

An interesting exercise for copyright students is contained in a paragraph on the back of the title page. "Grateful acknowledgement is made to Marquis-Who's Who, Inc., for permission to use the words 'Who's Who' in the title of this book. Marquis-Who's Who, Inc., is in no way connected with the publisher of this book." A. and C. Black please note! —F.H.S.

GREAT ESCAPE STORIES. Edited by Eric Williams. 256 pp., 5¼ in. by 8¼ in. Illustrated. Weidenfeld and Nicolson. Price 12s. 6d.

AIMED at the younger reader, this collection of 12 great escape stories of modern times has been compiled by Eric Williams of "The Wooden Horse" fame. It deals in an easily readable style with just some of the adventures which befell escaping members of all branches of the Services (not only British). An exception is the exciting extract from the diary of Mme. Anne Brusselsmans, who was responsible for aiding the escape of so many allied airmen from Nazi-occupied Belgium in the Second World War.

In his preface the editor has tried to convey the feelings and emotions of a man who has the will to escape. A brief introduction before each story gives the background of the escaper. In short this book sets out to make the reader feel exactly like an escaper, and when your heart begins to beat faster with the excitement of it all, you know that it has succeeded.—R.S.H.

THEY FLEW THE ATLANTIC. By Robert de la Croix. Translated by Edward Fitzgerald. 226 pp., 5 in. by 7¼ in. Illustrated. Frederick Muller, Ltd. Price 18s.

ALTHOUGH it is nearly 40 years since the Atlantic was first crossed by air, and it is not unusual for an elderly lady to travel to America with a basket of eggs in her lap, there is still much interest—at least among authors—in the exploits of those who first attempted this oversea flight, whether or not they succeeded.

In this book, written in an easily readable though slightly verbose style, the author traces the history of Atlantic flight from an attempt by Walter Wellman in 1910 to fly his airship from the U.S.A. to Europe, up to the flights made just before the Second World War.

Aviation is not, unfortunately, the author's special subject: his earlier books have been concerned with mysteries of the North Pole, mysteries of the sea, and the conquest of the Antarctic.

Perhaps his greatest shortcoming is a lack of perspective. While considerable space is devoted to an unsuccessful Spanish attempt which resulted in the crew being forced down in North Africa and captured by Moors, the very first direct flight is perfunctorily dealt with in a couple of pages. The well-known crash-landing of Alcock and Brown's Vimy in a remote peat bog, which they mistook for a field, is rendered:

> At 08.30 hours the sound of an engine was heard in the air over Clifden aerodrome; a plane came in to land, rolled along uncertainly and then stood on its nose. Two men crawled out of its cockpit and introduced themselves to the airfield personnel who came running up.

Few aircraft are mentioned by their type names, and the reader, if he is at all interested in aviation, is left to wonder what might, in fact, be "the big machine" mentioned.

There are numerous errors: "Highcliffe" instead of "Hinchliffe"; "Ourly" instead of "Orly"; "MacIntosh and Fitzgerald" for "McIntosh and Fitzmaurice." Upavon is not in Cornwall. And the translator interprets *hydravion* as "hydroplane," which is not an aircraft anyway.

It is difficult to believe that during the first successful east-west crossing by the Junkers "Bremen" the typically laconic orders and comments of aircrew were replaced by, for example: "Fitz, be a good fellow, switch on, will you? I can't see very well."

It is a pity that one cannot write more encouragingly about this book, as de la Croix is obviously very experienced in creating an atmosphere of adventure, but while the book will undoubtedly appeal to the more sensation-loving public, it cannot be regarded as serious aviation history.—H.J.C.

Publications Received

AN AIRPLANE IN EVERY GARAGE. By Daniel R. Zuck. 192 pp., 5½ in. by 8¼ in. Illustrated. Vantage Press, Inc. $4.50.

CONE OF SILENCE. By David Beaty. 288 pp., 5¼ in. by 8 in. Martin Secker and Warburgh, Ltd. 16s.

SCIENTIFIC USES OF EARTH SATELLITES (2nd Edition). Edited by James A. Van Allen. 316 pp., 6¼ in. by 10 in. Chapman and Hall, Ltd. 75s.

WHITES AIR DIRECTORY AND WHO'S WHO IN NEW ZEALAND, 1958-59. Managing editor, Leo L. White. Compiled by N. E. Smith. 152 pp., 5¼ in. by 7¼ in. Whites Aviation Publication, Auckland. Price 10s. 6d.

News of Industry

Gyro Test Equipment

EQUIPMENT for the testing of low-wander-rate gyroscopes has been developed by the Weapons Research Division of A. V. Roe and Co., Ltd. The gyro under test is connected to a control rack which contains the necessary electrical supplies and monitoring equipment. These include a 400-c.p.s. tuning fork, a supply for feeding the spinner and signal generator, a heater control-circuit which maintains the gyro temperature within ±½° C. and a signal generator output meter which gives a direct indication of the angular displacement of the gimbal.

The gyro is mounted on a rotating table whose axis lies in the vertical plane through the local meridian; it can be inclined at any suitable angle to the vertical. The table is driven through a reduction gearbox by a servo motor whose signal input is derived from the gyro signal generator output. The "tightness" of this loop ensures that the table rate faithfully reproduces the gyro output rate.

The table has an optical pick-off arranged to give a phase reversal of an AC signal for every 18 sec. of arc angular movement. This signal drives a phase-sensitive relay so that a pulse output is obtained for each angular interval. Overall angular accuracy of each of these pulses is better than 1 sec. of arc; the cumulative error over the full 360° is from 2 to 4 sec. of arc.

The optical pick-off pulses are fed into an electronic interval selector, which can be set to give an output pulse for every 1 to 100 input pulses. Thus any angular interval can be selected from 18 to 1,800 sec. of arc (½°) in steps of 18 sec.

The interval selector output triggers a time counter fed by 10 millisecond pulses from the standard tuning-fork supply. The decimal counter has five digits and can thus measure the time taken for the table to move through any selected angle in a time up to 1,000 sec. Accuracy of time measurement is ± 1 count ± tuning-fork stability.

At the end of each count the counter reading is automatically scanned and fed to an electric typewriter. Two counters are employed so that one maintains the continuity of the count while information is being printed out from the other and vice versa.

Facilities are also available for subjecting the gyro to "toppling tests."

Ground Power Units

EIGHTEEN ground power units have been ordered by K.L.M. from Kromhout Motoren Fabriek D. Goedkoop Jr. N.V., of Amsterdam, for the ground starting and servicing of their Douglas DC-8 jet airliners.

Each of these units consists of a six-cylinder four-stroke Kromhout diesel engine directly coupled via a flexible coupling to a 75-kVA. synchronous three-phase alternator. The power factor of the alternator is 0.8, the voltage 200/115 and the frequency 400 c.p.s.

At its governed speed of 1,714 r.p.m. the engine has an output of 120 h.p. when operating at 500 ft. above sea-level and in an ambient temperature of 85° F. If the temperature is increased to 122° F. and the altitude to 3,280 ft., the output falls to 106-107 h.p. As the power absorbed by the alternator at 75 kVA. is 93 h.p. and the radiator cooling fan takes 5 h.p., there is still a margin of power available for full-load operation in these extreme conditions.

The power unit is designed for operation in both tropical and cold climates; it is mounted on a welded-steel trailer in a sheet-steel housing with removable inspection doors and ventilation hatches. Its weight with a full fuel tank is 5,720 lb. The fuel tank holds 40 U.S. gal., enough for 8 hours' running.

This ground power unit is stated to be suitable for the Boeing 707 and Lockheed Electra as well as for the DC-8. It can be produced in varying forms to meet customer requirements and a self-propelled unit has been designed for airline use.

Kromhout representatives in Great Britain and the British Commonwealth are Perman Engineering, Ltd., 51 Woolwich Church Street, London, S.E.18.

Radar Aerials by Avro

LONG-RANGE high-powered radar equipment needs large aerial structures which must withstand high wind loads while retaining their shape within close limits. They must also operate almost continuously under arduous conditions.

A. V. Roe and Co., Ltd. have studied these problems and applied aircraft structural principles both to the stressing and construction of radar aerials. They have designed and manufactured both large radar aerial structures and reflector faces which embody metal sandwich construction. This method of manufacture ensures accurate aerial profiles and shapes and allows the actual face of the aerial to be used as part of its structure, thereby saving weight. It gives a light-weight structure which, when built in sectional form, facilitates transport and erection on remote sites.

The inherent stiffness of sandwich construction maintains the profile and shape of these aerials in high winds and improves their fatigue life. Sandwich construction allows both single- and double-curvature faces to be produced with equal accuracy. Avro facilities include computers for structural analysis, and wind-tunnels in which the static and dynamic behaviour of models of complete aerials has been studied.

Radar aerials with a face area of up to 1,000 sq. ft., and their supporting structure, have been designed, constructed and erected. Aerials with a face area up to 3,500 sq. ft. have also received detailed study.

Enthusiasts' Contest

STRONG support from Bristol's marked this year's Championship Meeting of the Aircraft Recognition Society, held for the first time at the Royal Society of Arts' fine old building in the Adelphi, London, on January 17. Peter Masefield maintains the interest in the young "air-farer," which he has had since the days of "THE AEROPLANE Spotter" and, as the Society's president, he always attends the meeting to present the prizes and encourage the competitors.

This year he presented a fine model of the Bloodhound missile for competition among the Services. Then "Bill" Pegg, Bristol's ex-chief test pilot, was the guest speaker discoursing with illustrations on test flying over the years.

After 35 pictures of aircraft, ranging from Swordfish to "Hare" (a Russian helicopter) had been briefly flashed on the screen, the following results emerged:—

Hurricane Trophy, for best team in any category: 1, R.O.C. 2/Q3 Wallington Post (M. Jamieson, M. Hook, J. Ware), 95 marks; 2, S.W. Essex Branch of Air Britain, 86.

Britannia Trophy, for best individual score: 1, M. Jamieson, 33; 2, R. Williams, 32.

Heracles Trophy: 1, No. 2236 Stanmore Sqn., A.T.C. (F./Sgt. I. Dunn, Cadets A. Wigmore and I. Melton), 85; 2, City of London School, C.C.F., 80.

Bloodhound Trophy: 1, R. Netherland Air Force, Breda (Lt. J. Valette, Sgt. A. Corneth, Pte. A. van Niekirk), 81; 2, R.A.F. Odiham, 74.

Air Pictorial Trophy: 1, Cadet A. Wigmore, 31; 2, Cadet I. Melton, 31.

Fokker D.21 Trophy: 1, Lt. J. Valette, 29; 2, Pte. A. van Niekirk, 27.

Fifty-eight three-man teams, ten more than last year, came from as far as Wales and Holland and included some newcomers, three Air Scout teams.—WREN.

In the Beginning

WITH regret we record the recent death of W. Snowdon Hedley, who was probably the first pilot to fire a belligerent aerial shot. Sqn. Ldr. Hugh Macphail, D.F.C., an ex-R.A.E. test pilot and an old friend of this magazine, tells us that he first met him between the two World Wars, in Sofia, where Hedley was the Mercedes-Benz agent and was at that time running a large garage.

He learned to fly on a Farman biplane at the Sopwith School, Brooklands, and held R.Ae.C. Pilot's Licence No. 274. Finding himself in Bulgaria when a minor war flared up in 1912, he somehow managed to lay his hands on an aeroplane. From this, he fired at troops on the ground with a revolver, the enemies' morale suffering more than their hide, one imagines. Such was the state of the art that Hedley probably had no airborne opposition to battle with. Anyway, it's certain that he was on the winning side because he was hailed as a national hero and settled in Sofia.

He is next heard of in Cairo in '41, whence he had travelled via Greece and Turkey when Bulgaria was invaded. He had not only lost all his early possessions, he was also *sans* his false teeth, a condition which he settled down to for the rest of his life. He was commissioned as a Pilot Officer, Equipment Branch—being then in his sixties—and remained in the Middle East until El Alamein time, when he was posted to England.

He spent the last five years of his life at Rudgwick in Sussex, not far from Dunsfold where Hugh Macphail has the "Three Compasses" pub just outside the Hawker airfield. Through Hugh, Snowdon Hedley kept in touch with aviation to the end.—WREN.

Private Flying

H.J.C.'s CLUB COMMENTARY

● FROM DENMARK, Per Weishaupt writes that home-building of light aeroplanes is increasing there. Some time ago we mentioned the aircraft of Arne Hollander, who without any technical training designed and built his own low-wing monoplane and got permission from the Civil Aviation Department to fly it. Since then interest has been centred on various French types.

The first Druine Turbulent was completed and flown last year. It was built by 60-year-old Hans Axel, of Vordingborg, in the south of Zeeland. He is no newcomer, as he designed and flew a Ford-powered high-wing monoplane in 1929, and his Turbulent is very well built and finished.

It is powered by a modified Volkswagen engine, which at first had single-ignition, but was modified to dual, after which a C. of A. was granted.

● THE **Royal Danish Aero Club** has assisted the amateur-building movement as much as possible, and has co-operated with the Royal Swedish Aero Club. In Sweden work on a Jodel D.112 two-seater has been standardized. Three or four of this type are being built in Denmark, along with three more Turbulents.

Several of them are expected to fly in the spring. The biggest problem is that of engines for the Jodel. It was originally believed that overhauled Continental engines could be obtained cheaply, but this has proved more difficult than expected.

● AS briefly mentioned last week, the Royal Danish Aero Club is celebrating its 50th birthday this year.

When this organization, then known as Det Danske Aeronautiske Selskab, began in 1909 its main activities were in ballooning, but it was only a short while before it was flying aeroplanes. The club became an important controlling organization before the First World War, and when that war began club members donated the first aeroplanes for the Danish army and navy.

● SO started that country's military aviation. Pilots' certificates were issued on behalf of the F.A.I., and aviation law was a matter with which the club was occupied.

Sporting flying, gliding and model flying developed in Denmark considerably during the 1930s, and their respective organizations became affiliated to the club, which became "Royal" in 1925 and was reorganized in 1950. All local clubs are now affiliated direct to the Aero Club.

Private and sporting aviation is not subsidized in Denmark, but a good deal of practical work has nevertheless been done.

● A MOVE towards increasing the social and "members-interest" side is being made by the **Elstree Flying Club.** The present members committee, which had become somewhat unwieldy, has been dissolved and until a new committee is elected at the annual general meeting on February 1 a temporary executive committee is in operation.

In 1958 the club flew a total of 4,554 hr. 30 min., an improvement of 732 hr. 10 min. over 1957. About half of the total has been on C.P.L. instruction.

Plans for this year include C.P.L. courses beginning on April 21 and August 18; the first is already filling up. Holiday courses for *ab initio* pupils will be held from June 6 to 21 and from July 18 to August 2. These are designed for people wanting to concentrate their training into short periods, which should be cheaper. Lectures will be held to cover the requirements of the various stages of the course.

Recently joining the club as an instructor is R. H. Robbins. Eddie Wild takes over as C.F.I. on February 1, with John Schooling as C.G.I. A farewell party for the former C.F.I., Bill Bailey, will be held in the clubhouse on February 7.

● A FLYING CLUB is proposed for Brunei, Borneo, and if it comes into being the Sultan has stated his intention of becoming the first member and gaining a private pilot's licence. The suggestion for a Brunei Flying Club came from Mr. R. L. Akers, president of the Kuala Lumpur Flying Club. The Sultan, who is 42, designs and builds his own speedboats.

John Fricker Flies a Vintage Favourite

A RECENT chance acquaintance at Croydon with one of the few surviving D.H. Leopard Moths provided a salutary reminder of British supremacy in light-aeroplane design in the halcyon flying days between the Wars. It also provided a rather sharper recollection of the lack of progress made in this country over nearly 30 years in this field, since few post-War British light aircraft bear favourable comparison with it, in terms of performance, handling, appearance or comfort.

The last-named feature is the most striking impression on entering the Leopard, the cockpit of which is luxuriously furnished with real leather upholstery on seats and walls, and has fine-quality carpeting on the floor. Accommodation is for three occupants. The pilot sits well forward in solitary splendour, in a comfortably padded but rather narrow backed seat, with a double seat behind him, all with armrests, and a liberal amount of room is available all round. Provision is made for dual control from the rear seat, but one would imagine that the forward view would be unacceptable for training.

Nowadays we would insist on getting four people into the same space, but by restricting the passenger load de Havillands achieved the primary aim of comfort, and were also able to provide an 18-gal. fuel tank in each wing root to give a very useful range of more than 700 miles, and still have some capacity to spare for 122 lb. of baggage, within the maximum gross weight of 2,225 lb.

Photograph copyright "The Aeroplane"

Unlike the earlier mixed wood, metal and fabric Puss Moth from which it was developed, the Leopard was of all-wood construction and had a rather cleaner airframe. The wings, in particular, which fold to reduce demands on hangarage, were of a more efficient shape, with straight taper on leading and trailing edges, and soon after its first appearance, in 1933, the Leopard demonstrated its superior performance by winning the King's Cup. In the hands of Mr. (now Sir) Geoffrey de Havilland, it achieved just under 140 m.p.h. over an 830-mile course.

Seated centrally behind the narrow cowling of the Leopard's Gipsy Major, which is backed by a small conical-shaped panel housing primary instruments, one has an excellent view forward, but the usual high-wing penalty on vision in other directions is accentuated by the thick wing roots. This is less noticeable on the ground, when the Leopard can be taxied by differential brake via the rudder pedals and a hand lever mounted on the port door. This system is still in use in the Chipmunk and other light aircraft, but ground manœuvrability of the Leopard could be improved by the addition of a steerable tailwheel.

Despite its advanced years, G-AIYS, which is very popular among the members of the Surrey Flying Club, leaps off the ground in a three-point attitude after a very short run and climbs briskly away at about 750 ft./min. In the air, its delightful handling qualities soon become apparent, the ply-covered ailerons being light and responsive at all speeds and harmonizing beautifully with the other controls. Changes of trim are, naturally, small, and half a turn of the imposing wheel by one's left

knee suffices to set the tailplane for hands-off cruise.

The positive lateral stability conferred by the high wing layout results in a very steady ride, and the noise level with the Gipsy purring away at about 1,950 r.p.m. is considerably lower than in many newer light aircraft by virtue of the long exhaust pipe under the fuselage. Both doors of the Leopard have sliding rear windows, which are a useful adjunct to the cabin ventilators in very hot weather and are also invaluable for photography—the primary purpose, as it happened, of our flight.

With its present wooden airscrew the Leopard settles down to cruise at something over 100 m.p.h., which is fair enough for a machine of its age, although the beautiful condition of G-AIYS belies its years. The chromium-plated window surrounds are as shiny as ever, but the spares situation must be something of a headache. As a wooden aeroplane, the Leopard must also incur a periodic and extensive internal inspection to conform with the recent A.R.B. notice, which is regrettably essential.

Only on the approach to land does the Leopard present a slightly vintage aspect, the absence of flaps resulting from its early design coupled with the clean airframe necessitating an uncomfortably nose-high attitude. With two up, G-AIYS was also far too nose heavy, even with full aft trim, for the speed to be easily reduced to the recommended 55-60 m.p.h., although the Leopard can be sideslipped easily enough to steepen the glide. It is a peculiarity of many aeroplanes that there is often insufficient aft trim (usually essential), but nearly always excessive forward trim, which is virtually never required.

Like the Puss and Hornet Moths, the Leopard has rotatable undercarriage leg fairings, which can be turned through 90°, via a large and knee-pranging lever on the right of the instrument panel, to act as air brakes, but their effect is, naturally, small at lower speeds. When the final approach speed is eventually achieved, however, very little further aft stick movement is needed for a three-point landing, which is not only very easy but very flattering through its smooth cushioning by the rubber-in-compression undercarriage.

If only a flapped Leopard Moth could be produced today for its original selling price of about £1,300 many of the problems of clubs and private owners would be solved, but alas, a similar machine would now cost at least three times as much. The fortunate owners of G-ACLL, G-ACMA, G-ACMN and G-AIYS, however, as well as other Leopard operators in Australia and Switzerland, should continue to enjoy many more years of pleasurable and economical flying in their veteran mounts.

Leading Particulars

DIMENSIONS.—Span, 37 ft. 6 in.; length, 24 ft. 6 in.; height, 8 ft. 9 in.; gross wing area, 206 sq. ft.

WEIGHTS.—Empty, 1,300 lb.; normal gross, 1,850 lb.; max. gross, 2,225 lb.

PERFORMANCE.—(Original figures.) Max. speed, 140 m.p.h.; cruising speed, 120 m.p.h.; stalling speed, 45-50 m.p.h.; initial climb, 850 ft./min.; service ceiling, 19,000 ft.; cruising consumption, 6 g.p.h. (20.4 a.m.p.g.); take-off and landing run, 140 yd.

Gliding Notes

by Dr. A. E. Slater

AT Victoria West, near the centre of Cape Province in South Africa, remarkable feats were done during a "performance rally" organized by Heini von Michaelis early this month, especially in the Slingsby Swallow which the Border Gliding Club has acquired—it happens to be the first production model. Boet Dommisse, who represented South Africa at last year's World Championships in Poland, tried to soar there on Christmas Day from his home at Pretoria 650 miles away, and managed 175 miles of the distance by air in his Moswey 4.

On January 4 Dommisse made 270 miles and was going strong when a thunderstorm petered out on him, and John Andrews soared locally for 5¼ hr. in von Michaelis's Minimoa. This modest acquisition of one leg towards his Silver "C" by Andrews was followed within 24 hr. by not only the rest of the Silver "C" but the distance leg of the Gold "C" as well, for on January 5 he got into the Swallow and started on the first cross-country flight of his gliding career. He made 190 miles due east to Molteno, slowly at first, and then covering the last 140 miles at 48 m.p.h.

Dommisse continued to distinguish himself, first with an out-and-return of 193 miles, and then, on the 8th, with 342 miles (550 km.) to the N.E. across a moderately strong N.W. wind. He reached his goal of Senekal, in the Orange Free State S.S.W. of Bloemfontein, in a final glide from 11,000 ft. attained in the only big cloud of the day, and thereby became holder of the South African distance and goal records and the first glider pilot in the country to add all three Diamonds to his Gold "C." This was his ninth attempt on the "distance Diamond" for 500 km.

On the following day John Andrews was at it again in the Swallow, and this time he not only exceeded 300 km. once more but reached his goal of Edenburg in the Orange Free State, 200 miles N.E. from Victoria West, and climbed 16,500 ft. on the way. So he became the fourth South African Gold "C" pilot and earned an additional Diamond. The flight took him 5 hr. 50 min. from a start at 11.30 hrs.

Among other feats in the Swallow were a 5¼-hr. flight by Beau Pautz; 7 000 ft. by Dommisse followed by a 42-km. out-and-return, and another 200-mile trip to Edenburg, this time piloted by Heini von Michaelis, who said he had "never had a more comfortable flight."

* * *

THE United States Congress has passed, and the President has signed, a law permitting aliens to operate aircraft transmitters over the country. As the Soaring Society of America says in its latest newsletter, "Alien sailplane pilots, please note." Also please note that you must get an application form from the Federal Communications Commission, and that you don't have to pass an examination.

This newsletter refers to a photograph in THE AEROPLANE showing Tim Bowles, at Camphill, sitting in an open cockpit with his trained falcon perched on his fist, and wonders whether the bird was to be trained to find thermals. Its owner would not admit to this intention, nor would Dr. August Raspet, in the United States, who was once seen trying to train vultures but said it was only for making aerodynamic flight tests.

To go further back in history, the *Illustrated London News* of February 25, 1933, had some photographs of tame falcons and eagles being allegedly used for the instruction of pupils in a gliding school at Ortelsburg, in East Prussia. But the most unconvincing feature of the affair was a photo of the glider, which was an open Primary.

* * *

THE CAMPHILL WAVE of October 19 last, which provided lift up to 12,300 ft., and was described in these Notes on November 14, receives further attention in the Derbyshire and Lancashire club's newsletter. When Lawrence Robertson was half way up to his maximum of 10,000 ft., and the high cloud layer of the approaching warm front began to pass overhead, the cloud distribution just below him changed to that of a series of knobbly cloud streets parallel with the wind; yet he was still in the wave whose lift area lay transversely to the wind, with no visual clue to its exact position.

There is still much disagreement on what makes cloud streets form. The late Sir Gilbert Walker deduced from laboratory experiments that all you need is an increase of wind with height through the whole convection layer; but Dr. Joachim Kuettner, at the OSTIV meeting at Buxton in 1954, said that the fastest wind must be not at the top of the layer but somewhere near the middle, at about the level of cloud base. Dr. Dick Scorer, on the other hand, attributes each street to a succession of thermals from a fixed source.

The evanescence of some wave clouds was shown when Robertson, having got 10,000 ft. over the clubhouse, pushed on to another wave cloud above which John Tweedy had just reached 12,300 ft.; but within 5 min. the whole cloud disappeared, and so did its lift.

Walter Neumark, in the same newsletter, suggests that better use could be made of waves if two or more pilots would deliberately co-operate in finding them, as is often done when searching for thermal lift. For this, a very light, short-range radio would be most desirable. When the wind blows hard enough for a sailplane to hover, a frequent technique is to creep slowly forwards or drift slowly backwards in order to find the best lift. But this manœuvre is apt to be hampered, Neumark writes, by inability to see the wave cloud just behind, owing to poor backward visibility from most British machines.

* * *

FOR the National Championships, which will be held from May 9 to 18, many tugs will be needed to launch competitors. The organizers (at Lasham aerodrome, near Alton, Hants) would like to hear from anyone who has a suitable aeroplane for hire, preferably already fitted with a towing hook.

A Gliding Conference

TOMORROW, January 31, a conference entitled "Learn About Gliding," is to be held at the W.R.A.C. Drill Hall, Duke of York's Headquarters, King's Road, Chelsea, London, S.W.3, from 14.30 hrs. to 18.00 hrs. It is organized by the British Gliding Association in conjunction with the London and South-east Region of the Central Council of Physical Recreation.

The conference is intended as an introduction to gliding, and the speakers will include Mr. Philip Wills, C.B.E., B.G.A. chairman; Mrs. Ann Welch, M.B.E., vice-chairman of the B.G.A. and chairman of the instructors' panel, and Mr. Derek Piggott, who is C.F.I. of the Lasham Gliding Centre.

Tickets cost 5s. each, or 2s. 6d. for the under-21s, and are obtainable from the B.G.A. (19 Park Lane, London, W.1), or from the Central Council of Physical Recreation (6 Bedford Square, London, W.C.1).

A.T.C. GLIDING.—Peter Noble, 18, of the Reading Squadron 2287 Presentation College unit of the Air Training Corps, has recently been promoted to the newly introduced rank of Cadet Warrant Officer. He is taking a gliding course at White Waltham.

Correspondence

Looking Ahead in "The Aeroplane"

C. G. GREY was right to stress good low-speed characteristics in aircraft. The comments he would make on modern jets would probably be quite unprintable. Your correspondent, Mr. Birkhead (THE AEROPLANE, January 16), is, however, going too far when he sees this as a push in the direction of VTOL aircraft of unconventional design.

C. G. Grey's views on the helicopter, for instance, were almost wholly condemnatory, as reference to correspondence I had with him in 1943-44 will show. I was then using the necessary pseudonym of "Navy Plumber," and as I recall, the letters ended with one of C. G. Grey's usual forceful footnotes appealing to time as the arbiter.

This is not to say that C.G.G. was not farseeing—he was, but he would probably have been even ruder about the heresy of balancing an aircraft on a jet than he was about using rotating, in place of fixed, wings.

Sanderstead. D. H. BROOME.

VTOL in 1948

MR. E. BIRKHEAD'S letter on "Looking Ahead in THE AEROPLANE" (THE AEROPLANE, January 16) has recalled the pleas for reducing landing speed so often made by my old friend C.G.G. who, as far as I recollect, had never visualized "Rectangular" flight in the form I advocated in my article on "The Clipper of the Clouds," which you published in THE AEROPLANE of December 24, 1948, in which the case for a very fast vertically rising aircraft was examined.

This article first discussed Jules Verne's conception of a heavier-than-air craft and showed that at that time (1948) it seemed practicable using four modern piston engines. It went on to propose a means of achieving a high speed in the horizontal, or cruising, component of the rectangular flight, the successful accomplishment of which depended on riding on a wing too small in area to give support at low forward speeds, and on the ability to stop and to park "end-on" the airscrews, used to lift the aircraft from the ground and to let it down again vertically for landing.

The proposed use of several airscrews for vertical translation, in lieu of a helicopter rotor, is relatively inefficient, admittedly, but the article argued that these airscrews would be active for a few minutes only; moreover, the rate of climb vertically has no need to be rapid in the case of a passenger carrier. Parking the screws for minimum drag when cruising is indeed a problem, but if their drag could possibly be minimized by this means after the power had been transferred to forward propulsion—and this does not appear to be at all feasible when a multi-bladed rotor of large diameter is used—their inefficiency might well prove excusable in view of the benefit conferred, i.e., a high cruising speed. The difficulties are immense but the prize, a really fast helicopter, is tantalizing.

I hoped that the effect of my article would be to stimulate thought in this direction, which it may have done. In his leader to it, the Editor observed that "the possibility of building directly ascending and alighting aircraft of large size is no longer remote" and the Fairey Rotodyne, with nearly 200 m.p.h. to its credit, has already greatly encouraged those who seek to realize a fast aeroplane with helicopter characteristics.

Cheltenham. CLIFFORD W. TINSON.

BIATA and Lower Fares

SOME of the comments in the article "Compromise or Rate-war?" (THE AEROPLANE, January 16) might give the impression that British independent operators are opposed to the introduction of certain lower air fares in Europe.

As the current deliberations within the IATA Traffic Conference—and the outcome—are not available whilst the Conference is in adjournment, I can only at this stage again state that the independents are not opposed to the introduction of lower fares or lower fare structures, and quite the contrary is the case as the record has shown consistently.

A. M. BLAKEMORE.
(Secretary, BIATA.)

[BIATA seems to have misunderstood our comments. The paragraph concerned referred to the British independent IATA members' resistance to B.E.A.'s fill-up inclusive-tour proposals—not to those for tourist-fare reductions. The reasons for this resistance were much too complicated for explanation in the context of the article. All that can be said is that what is sauce for the goose should also be sauce for the gander. Our sympathies are extended to all the IATA members whose viewpoints and cases can only be explained publicly at the risk of a $25,000 fine. Under that threat to informants we can only listen to gossip and then make guesses in our efforts to explain some of the fares and rates problems which face the airlines.—ED.]

Wroundabout

No Orbits for Britannia. *Manchester Guardian* headline: "BRITANNIA IN SPACE—HAWKER CHIEF URGES ACTION." Come, Sir Thomas, this kind of rough talk will get you nowhere. And even when the new Avro airliner is available, you could hardly call it a Britannia replacement.

*

Beagle Airways? I really thought the independents and the Corporations were drawing in their claws when I heard that Eagle were publicizing B.E.A., but alas, it was only a reprint from the *Eagle* boys' paper which the Corporation were distributing.

*

R.A.F.—'36—M.E.—V.I.P. Some of the best aviation stories (and songs!) were originated by the R.A.F. in the Middle East during those wonderful years between Wars, and Group Captain Gilbert Howie, now our Air Attaché in Ankara, has been moved to recall one of them after recognizing an old favourite in a recent Wroundabout. In 1936, a No. 70 (B.T.) Sqn. Valentia (cruising speed 90 m.p.h.) took a long and bumpy time to fly from Rutbah to the home station at Hinaidi. On arrival, the pilot explained to their distinguished V.I.P. (Army) passenger that it was all due to strong headwinds. He replied that he thought that must have been the case as he'd found it very draughty inside.

*

Martlesham Memory. The same golden 'thirties were recalled by Bill Pegg at the Aircraft Recognition Society's Championships. As an R.A.F. test pilot at Martlesham Heath, he, with another pilot, was called upon to put the Mew Gull through its tests, quickly—it was to fly in the King's Cup. They got it in the morning, saw it had no fuel cock in the cockpit, as it must have; it was returned to the factory, modified, and was back at Martlesham in the afternoon. Test flying was completed by 7.0 that evening. Nowadays? Six weeks? Sixteen thousand pounds?

*

Vickers' Slickers. Bob Blackburn, Vickers Aircraft's asst. publicity manager, tells me that he and salesman John Pereira were both wearing the popular British chromium-buttoned navy blue blazer when they arrived in Warsaw to make arrangements for the Viscount demonstration a while ago. The Poles asked them what organization this was the uniform of and, do you know, neither of them thought of saying: "We are two of the Edwardsians you've heard so much about."

*

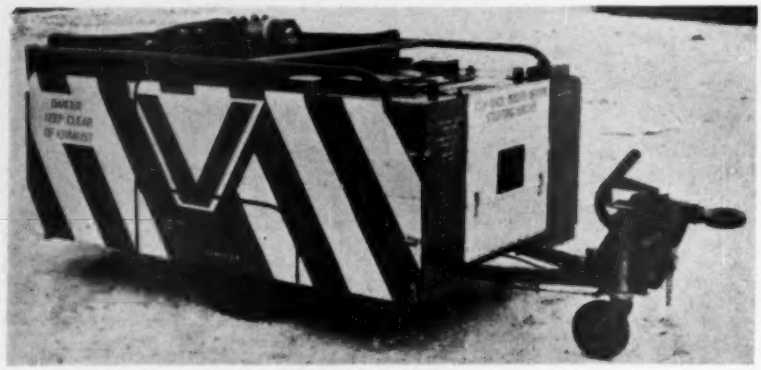
"What, taxy it in myself?" The Lear Flight Control System "tells the pilot where he is, where he was, where he is going and what to do to get there." Very discreetly, it leaves the pilot to decide for himself what to do *when* he gets there. And they have the nerve to ask for higher pay!

*

Sentenced. A summer event was a Naval friend's wedding at which the best man, an R.A.F. officer, couldn't turn up because he was prosecuting at a court martial. Much the same sort of job, really.

by Wroundabout

NOTES AND EVENTS



STARTERS FROM BROUGH.—Blackburn and General Aircraft's engine division has received an order for low-pressure air starting units for the R.A.F. The compressed air supplied by the Palouste gas-turbine air compressor will be used for starting V-bomber turbojets. Previous orders have been from the Royal Navy and the R.C.A.F.

A.D.A. BULLETIN.—Published by the Aluminium Development Association of 33 Grosvenor Street, London, W.1, at 2s., "Bending Aluminium" deals mainly with the more usual bending operations of aluminium sheet and strip, plate, bars and sections, and tubes. It is intended for production engineers, designers, draughtsmen, etc., and is also of use to operators and apprentices.

SMITHS DIVISIONS.—Smiths Aviation and Marine Divisions have been formed to direct and co-ordinate a number of units of S. Smith and Sons (England), Ltd., and its subsidiary companies. These include Smiths Aircraft Instruments, Ltd.; Smiths Industrial Instruments, Ltd.; Waymouth Gauges and Instruments, Ltd.; David Harcourt, Ltd.; and Kelvin and Hughes, Ltd., and that part of the business of S. Smith and Sons (England), Ltd., devoted to the manufacture or sale of aviation and allied products. The constituent companies of the new divisions will continue to function through their respective boards and executive managements. Chairman of the co-ordinating board will be Mr. R. Gordon-Smith.

SPERRY REORGANIZED. — The main object of substantial reorganization just announced within the Sperry Gyroscope Co., Ltd., Brentford, is a decentralization of management and the setting up of three separate operating divisions. They are: Brentford (manager, Wg. Cdr. J. C. G. Bell), particularly responsible for aeronautical activities; Bracknell (manager, Mr. H. B. Sedgfield, M.B.E.), to concentrate on Government work for guided weapons and inertial navigation, and Industrial (manager, Mr. M. L. Jofeh, O.B.E.), responsible for control engineering, hydraulics, etc.

SERVICE AT SOUTHEND.—Formed in October last year, Airborne Catering (Southend-on-Sea), Ltd., provides commercial operators with all their foodstuffs, etc., for cabin services. Operations are at present centred on Southend Airport. Managing director of the company (which has its offices at Holmwood Hotel, First Avenue, Westcliff-on-Sea, Essex) is Mr. H. H. Snowball, M.H.C.I., M.R.S.H., an hotelier for 11 years.

PORTABLE TESTER.—The P.V. system test set now being marketed by Bryans Aeroquipment, Ltd., of Mitcham, Surrey, is for checking both pressure and vacuum systems at positive and negative pressures within the range of 1 p.s.i. absolute to 115 p.s.i. absolute.

AVIATION BIBLIOGRAPHY. — A collection of books on aeronautics will come up for sale at Sotheby's, 34 New Bond Street, London, W.1, on February 11. They will include many historic volumes.

Company Notices

NEW COMPANIES

Aeroquipments, Ltd. (618,304).—Private co. Reg. Jan. 6. Cap. £100 in £1 shs. Objects: To carry on the business of aeronautical engineers and consultants, etc. Directors: William G. Hemsley and Elizabeth E. Hemsley, both of 18 East Green, Blackwater, Camberley, Surrey. Sec.: W. G. Hemsley. Solrs.: Herrington and Carmichael, Camberley. Reg. off.: Blackbushe Airport, near Camberley, Surrey.

Air Stock West Africa, Ltd. (618,664).—Private co. Reg. Jan. 12. Cap. £1,000 in £1 shs. Objects: To carry on the business anywhere in West Africa or elsewhere in the Continent of Africa as a selling agency for the sale of aircraft and aircraft equipment, etc. Permanent directors: Frank H. Mann, Longpark, Torquay; Nigel D. Norman, Elm House, Bembridge, I.o.W.; Forester R. J. Britten, James M. McMahon, all directors of Crop Culture (Aerial), Ltd., etc.; Christopher C. McCarthy Jones. Sec.: P. J. W. King. Solrs.: Beaumont and Son, London, E.C.2. Reg. off.: Bembridge Airport, I.o.W.

English Electric Aviation, Ltd. (618,578).—Private co. Reg. Jan. 9. Cap. £6,000,000 in £1 shs. Objects: To acquire that part of the undertaking of the English Electric Co., Ltd., which is concerned with design, research and development work in the field of aircraft research, development, assembly and production in the field of guided weapons, and to design and to undertake research and development work in connection with, and to manufacture, construct and deal in aeroplanes, airships and other aircraft, guided missiles, rockets and other machines and apparatus, etc. Subscribers (each with one sh.): Gladys Grant, secretary, and Edith Moss, secretary, both of 59-67 Gresham Street, London, E.C.2. First directors not named. Solrs.: Linklaters and Paines, 59-67 Gresham Street, London, E.C.2.

New Patent

APPLICATION ACCEPTED

810,138.—Del Mar Engineering Laboratories. — "Frangible aerial tow target."—May 28, 1956.

Application open to public inspection on March 11, 1959; opposition period expires on June 11, 1959.

Aviation Calendar

February 2.—R.Ae.S. Derby Branch lecture, "Performance Problems in Large Rocket Engines," by S. L. Bragg, at the Rolls-Royce Welfare Hall, Nightingale Road, **Derby,** at 18.15 hrs.

February 2.—R.Ae.S. Henlow Branch, Presidential Address, by L. H. G. Sterne, in Building 62, R.A.F. Technical College, **Henlow,** at 19.30 hrs.

February 2.—R.Ae.S. Glasgow Branch, Graduates and Students Section lecture, "Tropical Trials of the Scottish Aviation Twin Pioneer," by J. Chalmers and Captain J. Blair, at the Scottish Aviation Technical School, **Prestwick,** at 19.30 hrs.

February 3.—R.Ae.S. Boscombe Down Branch lecture, "The Training of Soviet Engineers," by E. G. Sterland, in the lecture hall, A. and A.E.E., **Boscombe Down,** at 17.45 hrs.

February 3.—R.Ae.S. Luton Branch lecture, "Systems Simplified," by J. Wotton (Hunting Aircraft), in the Napier senior staff canteen, **Luton Airport,** at 18.15 hrs.

February 4.—R.Ae.S. Brough Branch lecture, "Production of the P.1," by T. O. Williams (English Electric), at the Royal Station Hotel, **Hull,** at 19.30 hrs.

February 4.—R.Ae.S. Christchurch Branch lecture, in conjunction with the British Association for the Advancement of Science, at the King's Arms Hotel, **Christchurch,** at 19.30 hrs.

February 4.—R.Ae.S. Gloucester and Cheltenham Branch lecture, "Supersonic Propulsion," by Dr. R. R. Jamison (Bristol Aero-Engines), at the Wheatstone Hall, Brunswick Road, **Gloucester,** at 19.30 hrs.

February 4.—R.Ae.S. London Airport Branch lecture, "Powerplants of the Future," by A. A. Lombard (Rolls-Royce), in the lecture hall, Fairey Aviation Co., **Hayes,** at 18.15 hrs.

February 5.—R.Ae.S. Main Lecture at Hatfield Branch, First Halford Lecture, by J. L. P. Brodie, in the main hall, Hatfield Technical College, **Hatfield,** at 18.15 hrs., followed by Branch Annual Dinner.

February 5.—R.Ae.S. Bristol Branch lecture, "Guided Weapons—III," at Filton House, **Bristol,** at 18.00 hrs.

February 5.—R.Ae.S. Isle of Wight Branch lecture, "Vertical Take-Off Aircraft," by Prof. E. J. Richards, at the Saunders-Roe Sports and Social Club, Church Path, **East Cowes,** at 18.00 hrs.

February 5.—R.Ae.S. Swindon Branch lecture, "Technical Education," by Prof. A. R. Collar, at The College, Victoria Road, **Swindon,** at 19.00 hrs.

February 6.—Helic. Assn. of G.B. lecture, "Some Engineering Aspects of Helicopter Assessment Trials," by H. J. Webb (Airborne and Helicopter Division, A. and A.E.E.), in the R.Ae.S. Library, 4 Hamilton Place, **London,** W.1, at 18.00 hrs.

February 7.—British Interplanetary Society lecture, "High Energy Fuels and Rocket Propulsion," by Dr. F. Fitzgerald (Birmingham College of Technology), at Caxton Hall, Caxton Street, **London,** S.W.1, at 18.00 hrs.

February 9.—R.Ae.S. Halton Branch lecture, "Flying the F.D.2," by L. P. Twiss (Fairey Aviation), at the Branch H.Q., R.A.F. **Halton,** at 18.45 hrs.

February 9.—R.Ae.S. Cambridge Branch, film show, in No. 1 lecture theatre, University Engineering Laboratories, **Cambridge,** at 20.15 hrs.

Birth Notices

Bathe.—On January 11, to Marie (*née* Lambton), wife of Flg. Off. M. J. Bathe, R.A.F.—twin sons.

Bolton.—On January 11, at Beckenham Maternity Hospital, to Elizabeth, wife of Flt. Lt. J. F. Bolton, R.A.F.—a daughter.

Bowater.—On January 17, at County Hospital, Hereford, to Joan (*née* Hughes), wife of Flt. Lt. M. V. Bowater, R.A.F.—a daughter.

du Plessis.—On January 10, in Malta, to Mary (*née* Barnett), wife of Flt. Lt. P. du Plessis, R.A.F.—a daughter.

Longford.—On December 17, at Singapore, to Suzanne (*née* Nicod), wife of Flt. Lt. U. D. B. Longford, R.A.F.—a son.

Penrose.—On January 17, at Farnborough, to Dorine (*née* Stewart), wife of Flt. Lt. J. D. Penrose, R.A.F.—a daughter.

Shaw.—On January 20, at Cress Bank Hill, Hurworth-on-Tees, Darlington, to Angela (*née* Shaw), wife of Flt. Lt. A. W. Shaw, R.A.F.—a daughter.

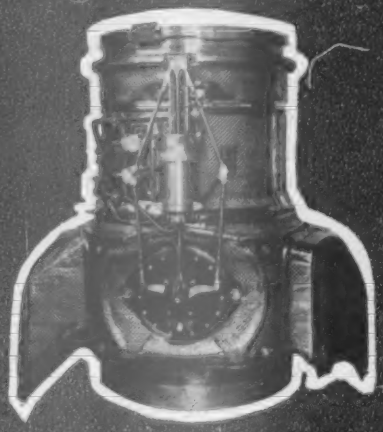
West.—On January 9, at the Maternity Hospital, Stroud, Glos., to Prudence, wife of Sqn. Ldr. R. E. West, R.A.F.—a daughter.

Successful heat exchange and heat insulation

Success in our business doesn't merely mean the ability to manufacture, though we are extremely well equipped, even to the extent of having our own aluminium flux bath brazing plant.

Success to us, means the ability to solve problems; to produce something that will do a new job, or perhaps an old job in never-before-experienced circumstances. And then, of course, to make it a practical and economical proposition.

We have forty years experience and wide resources. If we can help you in any way with heat exchange and insulation equipment, please contact us. We are always at your service.



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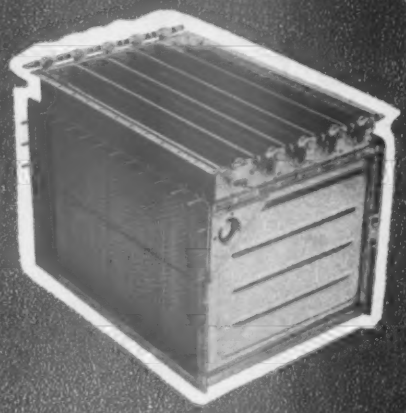

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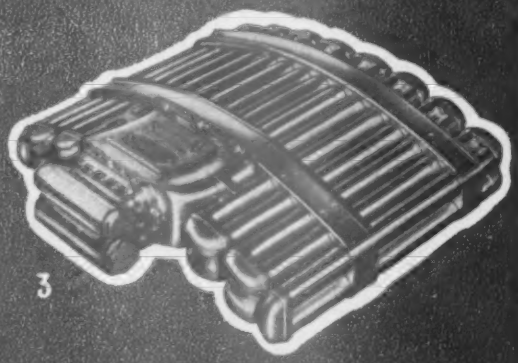

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1 *These thermal blankets are made of refractory fibre cased in .004 inch (.1016 mm) stainless steel. They are made-to-measure and are extremely light, the dimpled construction being responsible for their great strength. Specified for Rolls-Royce and Armstrong Siddeley jet and turbo-prop engines, these particular examples are shown fitted to the Rolls-Royce thrust reverser for the de Havilland Comet.*

2 *We design, manufacture and supply heat exchangers for many purposes in both aluminium alloy and stainless steel. This particular example is for the Vickers Vanguard's anti-icing system. Similar units are being supplied for the Fokker Friendship, the Bristol Britannia, the Armstrong Whitworth Argosy, the Vickers Viscount and the Handley Page Herald.*

3 *High pressure fuel-cooled oil cooler for high performance gas turbine engines. This unit is used in the Armstrong Siddeley Sapphire S.A.7.*

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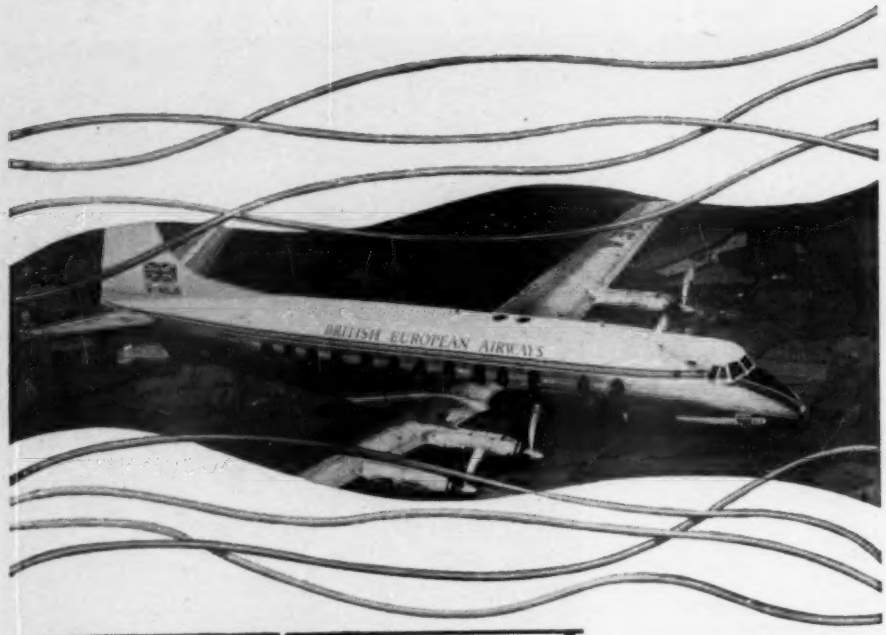

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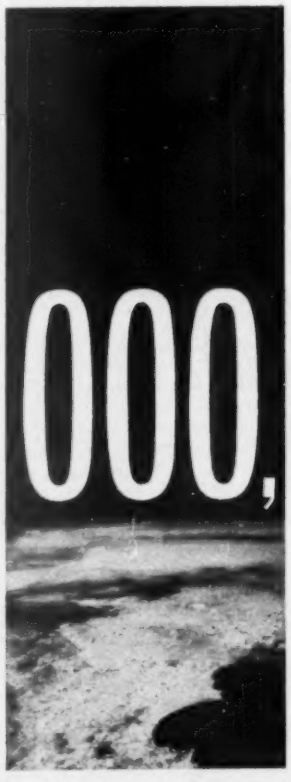

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G.62

THE AEROPLANE CLASSIFIED ADVERTISEMENTS

PRESS DAY: Classified Advertisements must normally be received at Head Office by FIRST POST THURSDAY for the following Friday week's issue. Last-minute additions and deletions are accepted by telephone from trade advertisers up to noon. Advertisements received too late for a particular issue are automatically inserted in the succeeding one unless instructions to the contrary are received.

RATES—10d. per word (minimum 12 words 10/-). Each paragraph charged separately and name and address must be paid for. Semi-displayed setting £3-12-6 per single column inch. Centred lines £1. Series discounts of 5% for 13, 10% for 26 and 15% for 52 consecutive insertions, allowed to trade advertisers.

TERMS—Strictly net and prepayable. Monthly accounts for settlement by the end of the month following insertion are allowed to trade advertisers if satisfactory references are provided.

REMITTANCES—Cheques and postal orders should be crossed and made payable to TEMPLE PRESS LIMITED and instructions sent addressed to the Manager, "The Aeroplane," Bowling Green Lane, London, E.C.1.

DEPOSIT SYSTEM—Facilities are available to readers to purchase advertised goods through "The Aeroplane." Commission 1% (minimum 2/-) on amount deposited.

BOX NUMBERS—Private advertisers desiring to have replies sent care of "The Aeroplane" may do so on payment of 1/- to cover booking and postage, plus cost of four extra words. Box Numbers must not be used for the purpose of circularizing and the Proprietors do not undertake the distribution of such matter received. To avoid mistakes in forwarding, Box Numbers should be carefully and legibly copied and replies sent to Box A000, care of "The Aeroplane," Bowling Green Lane, London, E.C.1.

THE PROPRIETORS retain the right to refuse or withdraw advertisements at their discretion and are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

HEAD OFFICES: Bowling Green Lane, London, E.C.1, England. Telephone: Terminus 3636. Telegrams: "Pressimus London Telex." Telex: 23839.

BRANCH OFFICES: Bayliss House, Hurst Street, Birmingham, 5. Telephone: Midland 6616. 50 Hertford Street, Coventry. Telephone: Coventry 62464. 1 Brazennose Street, Manchester. Telephone: Deansgate 6114-8. 12 Renfield Street, Glasgow. Telephone: Glasgow Central 1413.

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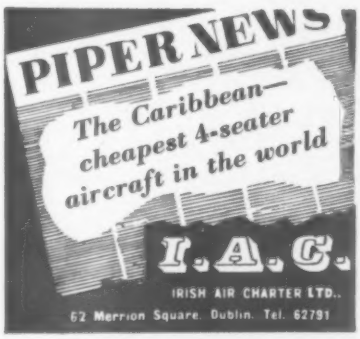
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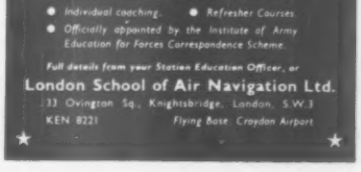
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ENGINE overhauls. Hants and Sussex Aviation, Ltd., offer British's most comprehensive complete overhaul service. Magneto overhaul service and component and spares supply. Specializing in all de Havilland Gipsy range, including Queen 30 series. United Kingdom distributors of Continental and agents for Lycoming. Also provide full cover for Cirrus range and Cheetah series. Most types available on exchange. Engines, components and spares shipped to all parts of the world. Address: The Airport, Portsmouth, Hants. Phone 63051. 474-622

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at RADLETT, HERTFORDSHIRE
has a vacancy for a

SENIOR FLIGHT TEST ENGINEER

Qualifications required are:—
Engineering Degree or equivalent. Several years experience of test flying.
Sound knowledge of handling, performance and systems data analysis.
This is a senior appointment with good salary and senior staff status for the right man.

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SENIOR STRESS ENGINEERS with at least 5 years experience, and

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also

TECHNICAL ILLUSTRATOR/ARTIST for work at their Head Office—Rearsby, Leicester.

Applications in writing detailing qualifications, experience and salary expected, to :—

Chief Designer, Auster Aircraft Limited.

NOTICES

AIR TRANSPORT ADVISORY COUNCIL

THE AIR TRANSPORT ADVISORY COUNCIL give notice that they have received the undermentioned applications to operate scheduled air services:—

FROM DERBY AVIATION, LTD., OF DERBY AIRPORT, BURNASTON, DERBY:—

APPLICATION NO. 473/2 for an amendment to the terms of approval of the seasonal U.K. Internal Service which they are authorized to operate at week-ends from May to September each year on the route Nottingham (opt.)-Derby-Ronaldsway (Isle of Man) so as to permit them to operate instead on the route Luton (opt.)-Northampton (opt.)-Nottingham (opt.)-Derby-Ronaldsway (Isle of Man.)

APPLICATION NO. 1585/1 for an amendment to the terms of approval of the U.K. Internal Service which they are authorized to operate on the route Derby-Nottingham (opt.)-Belfast so as to permit them to operate instead on the route Luton (opt.)-Northampton (opt.)-Derby-Nottingham (opt.)-Belfast.

APPLICATION NO. 487/3 for an amendment to the terms of approval of the seasonal Normal Scheduled Service which they are authorized to operate from April to October each year on the route Derby-Nottingham (opt.)-Birmingham-Ostend so as to permit them to operate also on the route Derby-Luton-Southend (opt. tech.)-Ostend.

These applications will be considered by the Council under the Terms of Reference issued to them by the Minister of Civil Aviation on July 30, 1952. Any representations or objections with regard to these applications must be made in writing stating the reasons and must reach tthe Council within 14 days of the date of this advertisement, addressed to the Secretary, Air Transport Advisory Council, 3 Dean's Yard, London, S.W.1, from whom further details of the applications may be obtained. When an objection is made to an application by another air transport company on the grounds that they are applying to operate the route or part of route in question, their application, if not already submitted to the Council, should reach them within the period allowed for the making of representations or objections. 474-1

FERRY. Transport pilot proceeding London-Sydney shortly will ferry whole/part distance free or act as supernumerary. Box A743, care of THE AEROPLANE. 474-x4257

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SENIOR designer required for light machine tools and tracer controlled copying machines. Desirable qualifications are an engineering degree or H.N.C., workshop training and design experience in this, or similar field. This appointment, located in Leicester, carries an attractive four-figure starting salary, which will be regularly reviewed. Working conditions are excellent and a pension and life assurance scheme operates. Box A734, care of THE AEROPLANE. 474-8793

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THE PERSONNEL MANAGER,
HUNTING AIRCRAFT, LTD.,
THE AIRPORT,
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University Entry.—University graduates may enter on permanent or four-year short-service commissions. Permanent commissions carry an ante-date. University students may be accepted subject to graduation. Age limits—19 to 24. (26 for Short-Service Commissions.)

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or

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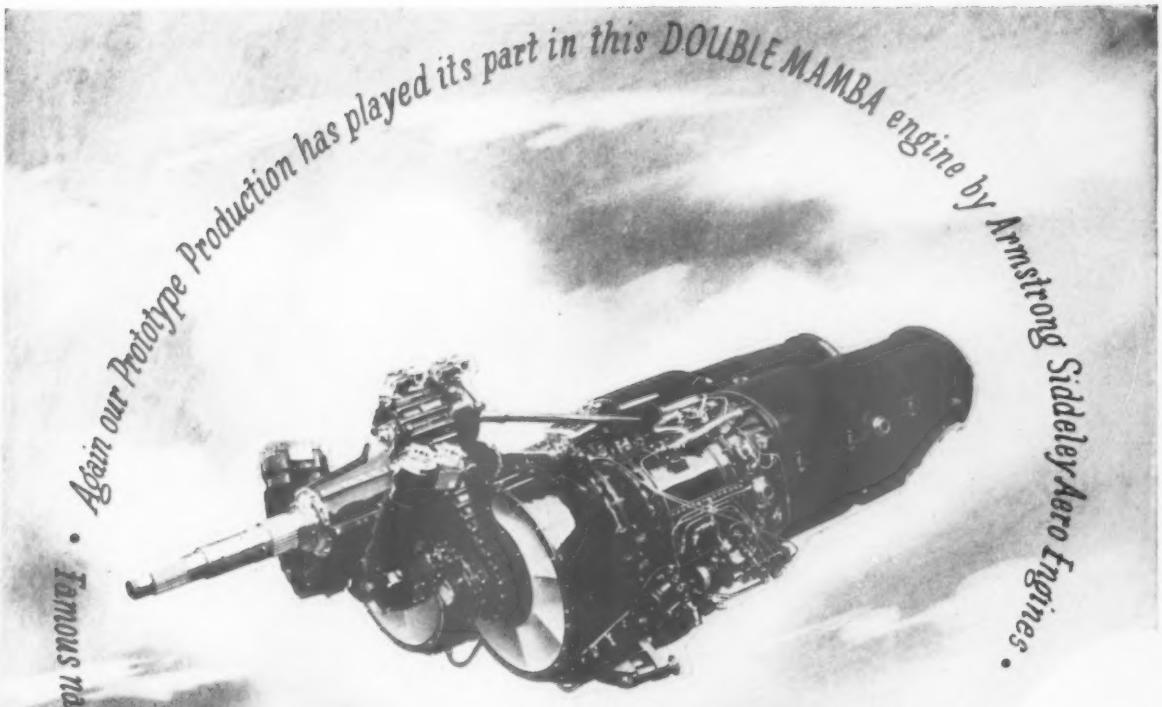
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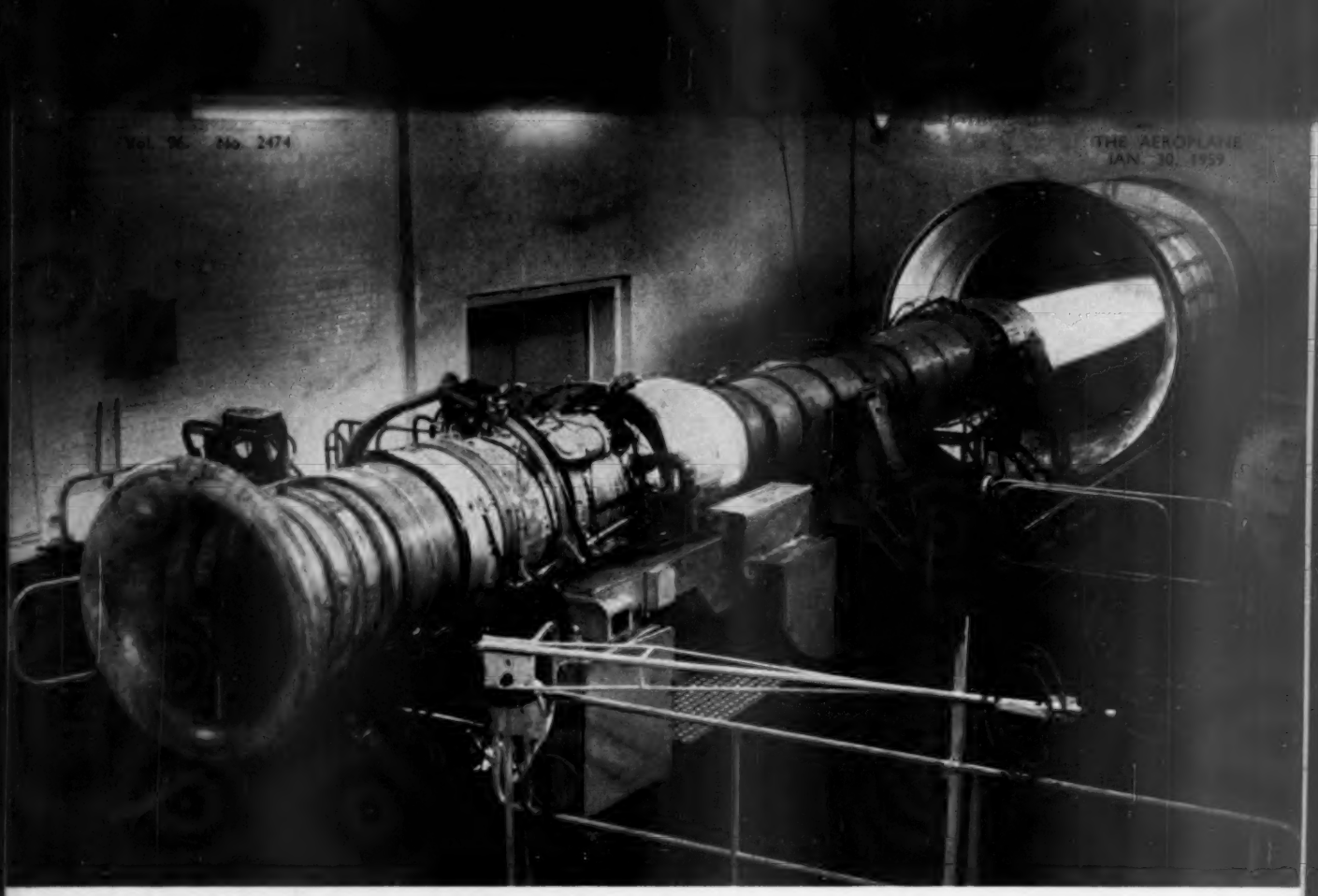

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